THE FOUNDRY

A TRADE JOURNAL

DEVOTED TO THE INTERESTS OF THE WHOLE FOUNDRY BUSINESS

Contents

A FURNACE PLANT IN ALABAMA —Illust. 221
AN IMPROVED FLASK PIN—Illust. 227
THE PHILBRICK PROCESS OF MAKING WROUGHT IRON CASTINGS—Illust. 229
PAYTON LADLE CARRIER—Illust. 231
POKEY'S POINTERS 232
EDITORIAL 235
Trade Outlook—A Pointer—Scrap Heap—Krank's Korner.
PITTSBURG AND VICINITY 237
CHICAGO AND VICINITY 239
HOW TO USE PLUMBAGO CRUCIBLES —JOHN A. WALKER 240
OIL AS A FUEL FOR CORE OVENS 241
QUESTIONS AND ANSWERS 244
BOOKS, EXCHANGES, CATALOGUES 246
OBITUARY 246
FOUNDRY MENTION 247
NEW ENGLAND FOUNDRYMEN'S ASSOCIATION 248
PHILADELPHIA FOUNDRYMEN'S ASSOCIATION 249
R. A. HADFIELD—Illust 255
CAST IRON NOTES—W. J. KEEP 257
NEW FOUNDRY ENTERPRISES 258
JAMES CHALMERS (Cont'd.)—W. EDWARD 259

FEBRUARY, 1896.

Vol. VII. No. 42.

Published Monthly by THE FOUNDRY PUBLISHING CO.

DETROIT, MICH.

A FACING and Blacking to be satisfactory for all kinds and weights of castings, that can be shaken on the mold and be slicked nicely, or when mixed with water will make a good core wash, that can be used for dry sand or loam work, stand the heat and weight of molten metal whether poured hot, slow or fast, and not burn off, wash or run and will peel clean from the casting, is a Facing and Blacking that we think should interest every foundryman and molder living.

Just such a Facing and Blacking is RADIANT, and furthermore, we guarantee it to be so and will take it back and refund the price if it is not. WHAT MORE CAN WE OFFER? Radiant Facing is sold entirely on its merits and nothing else whatever has had anything to do with the extraordinary success of this Facing and Blacking. We have had some foundrymen tell us that it is undoubtedly the best general Facing and Blacking they ever used, but that they thought the price was too high. Is 2¼ cents per pound too high for the best Facing and Blacking on earth? We have noticed that these same people will buy Plumbago or Silver Lead at twice and more the price and never complain. Plumbago or Silver Lead are all right. We sell them, and would like to sell a good deal more of them; but there are objections to their use in the foundry doing general work that are overcome by the use of Radiant Facing and Blacking. How many complaints we hear about the hardening of

the surface of castings? There is nothing that will harden the surface of the casting sooner or more effectually than Plumbago or Silver Lead. We grant that Plumbago or Silver Lead makes a beautiful mold and a pretty (?) bright looking casting; but the question is whether this color or a casting is more satisfactory than a dark blue steel color such as the Radiant Facing and Blacking gives it? Radiant Facing and Blacking will not harden the surface of the casting. It can be shaken on the mold, through a bag, on parts that cannot be reached with a tool to slick it, and the facing will stick and peel clean.

The whole matter is that Radiant Facing and Blacking is the very best, most economical and satisfactory Facing and Blacking for the general jobbing foundry. There is no question about this and if you have any doubts about it, send for a barrel subject to approval. Our guarantee is that it will do everything we have stated above, otherwise you need not keep it and we will pay the freight.

The J. D. Smith Foundry Supply Co.

Manufacturers of Foundry Facings, Blackings, Foundry Supplies, and Refiners of Plumbago.

Cincinnati, Ohio, U. S. A.

IT'S YOUR DESIRE

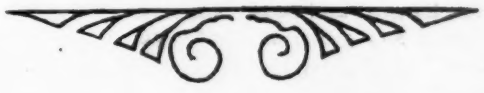
to make nice, bright, smooth Castings at a nominal cost,

AND
IT'S OUR DESIRE

to assist you in accomplishing it. Grant us this privilege and it will pay you and be a satisfaction to us.

We are making a specialty of the finest grades of **East India Plumbago** and **India Silver Lead** and invite correspondence on the subject.

Trial sample free.



THE S. OBERMAYER CO.

CINCINNATI, O. CHICAGO, ILLS.
LARIMER, PA.

Also manufacturers of "THE BEST" Facings, Blackings and Foundry Supplies in general.

ESTABLISHED 1855.

J. W. PAXSON J. K. BOUGHER
HOWARD EVANS H. M. BOUGHER

This may give you an Idea!

HOW really few people there are after all who appreciate the extent of the foundry business in this country or the multiplicity of interests involved therein. Take for instance the subject of Foundry Supplies and Equipments, of which we are the acknowledged largest dealers on the face of the earth. In order to fill the requirements of our trade, we operate steadily all the year round (night and day most of the time) the following mills on different work as follows:

Quaker City Mills, Phila, Pa.—XX Colombo Plumbago, East India Plumbago, Silver Lead, IXL Lead, XX Mineral, Premium Return, Banner Fire Proof, German Lead, Mineral Lead.

Lehigh Mills, Lehighton, Pa.—Pipe Blacking, Car Wheel Mineral Facing, Mineral Facing, Core Wash Facing.

Sea Coal Mills, Irwin, Westmoreland Co., Pa.—Sea Coal Facing, Bituminous Facing, Carbon Facing, Coke Facing, Charcoal Facing.

Annex Mills, Phila, Pa.—Anthracite Facing, Lehigh Facing, Charcoal Facing, Talc Facing, Soapstone Facing, Core Compound.

Welsh Mountain Mills and Quarry, Honey Brook, Pa.—Ground Silica Rock, Ground Ganister, Silica Clay, Kaolin, Steel Mould Wash, Furnace Bottom Sand.

In the matter of Foundry Equipments we Fill Orders Promptly for such things as

Cupolas, Cupola Lining, Blowers, Ladles, Core Ovens, Iron Flasks, Snap Flasks, Rumblers, Brass, Furnaces, etc.

Our line of Sands is the Largest and Most Complete to be found and consists of any grade of

Moulding Sand, Core Sand, Steel Sand, Clay, Gravel, Fire Sand, Mica Sand, Fire Stone etc.

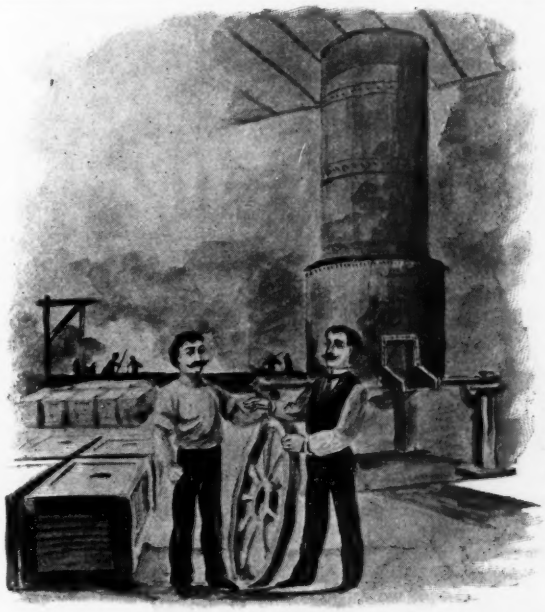
In addition to all these, our large Foundry Supply Factory is kept running full handed making

Riddles, Sand Sifters, Casting Brushes, Bristle Brushes, Metallic Letters, Moulders' Tools, Bellows, Wire Brooms, Flue Brushes, etc.

As we make all we sell, we guarantee every article.

J. W. PAXSON & CO.,

PHILADELPHIA, PA.



"John, I want six off this to-day and must have *first-class castings.* Be sure and use only **KELLY'S PLUMBAGO,** as they have got to be nice."

T. P. KELLY & CO.

MANUFACTURERS OF

Plumbago, Foundry Facings, and Blackings.

DEALERS IN

FOUNDRY SUPPLIES

We are the largest grinders of PLUMBAGO for FOUNDRY purposes in the United States. Our "B. M." brand of PLUMBAGO will assimilate with any SAND.

It is thoroughly purified, being chemically free of

ALUMINA, SILICA, MICA

AND OTHER IMPURITIES.

We GUARANTEE SMOOTH CASTINGS and satisfactory results wherever it is used.

MILLS AT
BLOOMSBURY, N. J.
AND
REISSING, PENN.

CHICAGO OFFICE:
121-127 NORTH ADA ST.
NEW YORK OFFICE:
284 PEARL ST.

McCULLOUGH DALZELL COMPANY
MANUFACTURERS OF
CRUCIBLES · STOPPERS
AND ALL ARTICLES CONTAINING PLUMBAGO
PITTSBURG, PA. U.S.A.

P. G. COCHRAN, Pres.
J. R. LAUGHREY, Treas.
JOHN H. WURTZ, Secretary
J. S. NEWMYER, Mgr.

Washington Coal & Coke Co

(CAPITAL PAID-UP $250,000.)

MANUFACTURERS OF

HIGH GRADE COKE

We Make a specialty of 72 Hour
Foundry Coke.

N. P. HYNDMAN, Sales Agent,

Room 8, Conestoga Building, 7 Wood St.

General Office, DAWSON, PA.

PITTSBURG, PA.

Crucible.

Crucible

Dipper.

Jewelers'.

Stirrers.

Cover.

Cover.

Stopper.

Crucibles

For melting STEEL, BRASS, COPPER, GOLD AND ALL OTHER METALS. We are the only PRACTICAL MEN in our business and we work strictly by CHEMICAL ANALYSIS; our CRUCIBLES will be found UNIFORM and RELIABLE at all times; they are well known all over this country and also Europe; send us a trial order and we will secure you as a customer. Also FINE GRAPHITE for LUBRICATING PURPOSES, for the devolopement of High Speed and Great Power. Our GRAPHITE is the purest in the market as Analysis will prove.

ROBT. J. TAYLOR & SON,

1900 to 1916 CALLOW HILL STREET, PHILADELPHIA, PA.

CHAS. M. JARVIS, President and Chief Engineer.
GEO. H. SAGE, Secretary

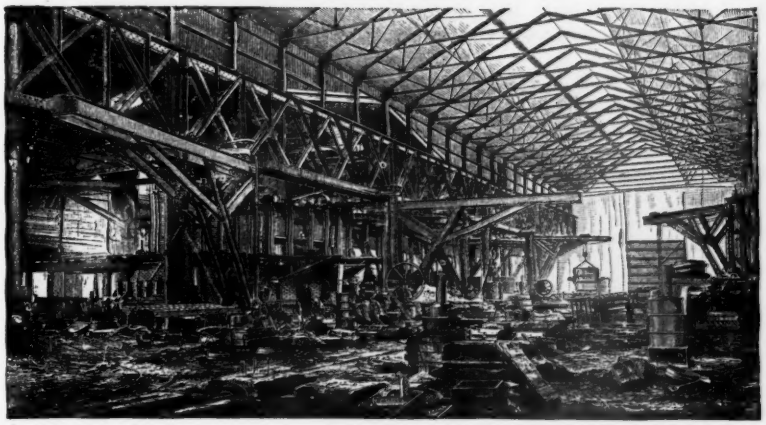
BURR K. FIELD, Vice-President.
F. L. WILCOX, Treasurer.

THE BERLIN IRON BRIDGE CO.,

ENGINEERS, ARCHITECTS

—AND BUILDERS OF—

Iron and Steel Bridges, Roofs and Buildings.



The above illustration, taken direct from a photograph, shows the interior of an iron foundry designed and built by us for the Farrell Foundry & Machine Company, of Ansonia, Conn. The building is 129 feet in width by 302 feet in length. The wings are 30 feet and 43 feet respectively, and the central portion is 56 feet in width. The central portion of the building is controlled by a hydraulic traveling crane with a travel the full length of the building and is also arranged with jib cranes for delivering material from the traveling crane to the cranes in the wing trusses.

Office and Works, - - EAST BERLIN, CONN.

SEND FOR ILLUSTRATED CATALOGUE.

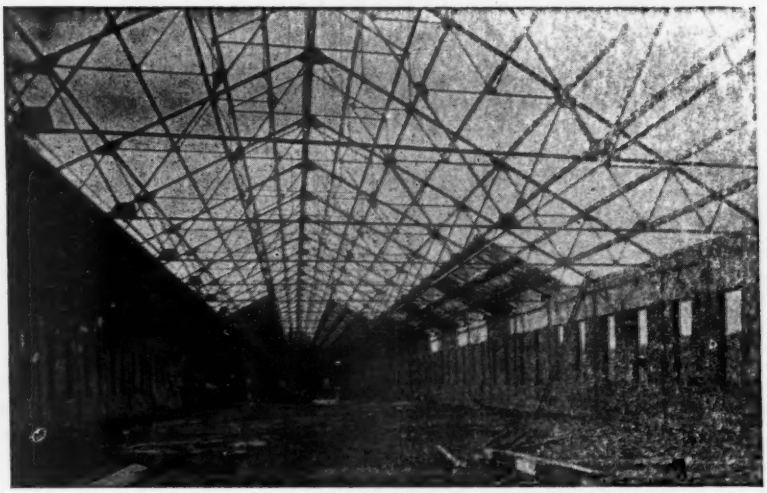
Wrought Iron Bridge Co.,

DESIGNERS AND BUILDERS IN
IRON AND STEEL
FIRE PROOF BUILDINGS

FOUNDRIES, MACHINE SHOPS
—FOR—
ETC., ETC.

Exterior of Foundry of Warder, Bushnell & Glessner Co., Springfield, Ohio.

Traveling and Jib Cranes for handling
Heavy Castings and Machinery.



Buildings Designed for Special
Requirements.

Interior Foundry Building of Warder, Bushnell & Glessner Co., Springfield, Ohio.

The roof of this building was erected by the Wrought Iron Bridge Co., Canton, Ohio, and consists of steel trusses supporting wooden purlins to which matched and dressed sheeting is nailed for slating. Trusses being 18 ft. above the floor, the wood work of roof is out of danger from fire, while the cover being of slate a suitable cornice to protect the overhanging of roof from flying sparks, or heat from the burning of neighboring buildings, renders this structure absolutely fire proof. Windows are set in the sides of ventilator throughout its entire length, so that ample light and ventilation is insured.

Wrought Iron Bridge Co.

ADDRESS NEAREST OFFICE.

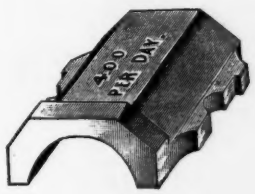
CANTON, O. KANSAS CITY, MO. CHICAGO, ILL.

136 Liberty St., NEW YORK.

ONE MAN'S WORK

—WITH THE—

TABOR AUTOMATIC MOLDING MACHINE



POURS CASTINGS TRUE TO PATTERN

MOLDS DO NOT BLOW

DUPLEX MACHINE.

Molds both parts of flask at one operation of machine, thus making two machines in one.

These machines are adapted to general castings when made in reasonable quantities.

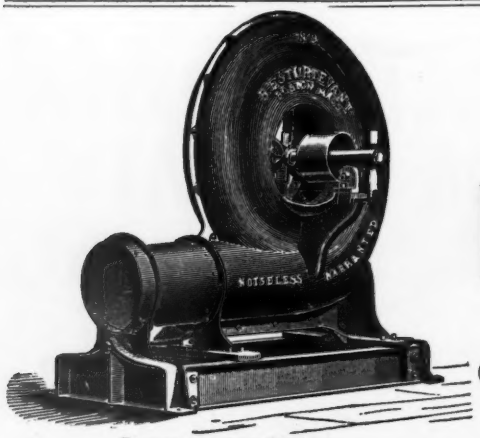
The use of these machines is a guarantee of economy, greater quantity and better quality in castings.

Foundrymen who are interested in producing cheap castings of superior quality are invited to correspond with the Company and call at the works, Front and Franklin Streets, Elizabeth N. J., and see the machines in operation.

The Tabor Manufacturing Co.

39 Cortlandt Street,

NEW YORK, - - - N. Y.



Blower on Adjustable Bed.

THE STURTEVANT STEEL Pressure Blowers,

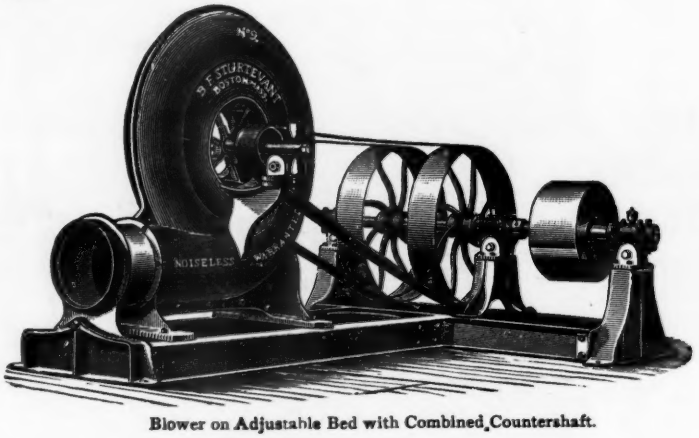
—FOR—

Cupola Furnaces and Forge Fires.

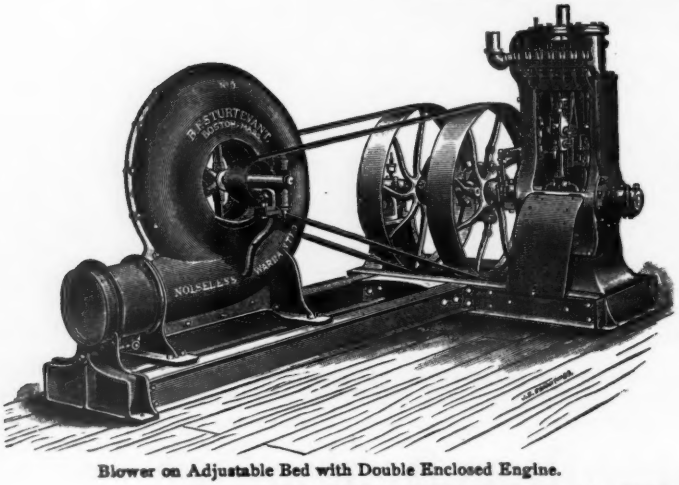
BLOWERS

Furnished without Bed with Separate Countershaft

BLAST GATES



Blower on Adjustable Bed with Combined Countershaft.



Blower on Adjustable Bed with Double Enclosed Engine.

BLOWERS

WITH

THE STURTEVANT

Direct Connected

Electric Motors

Send for Catalogue.

B. F. STURTEVANT CO.,

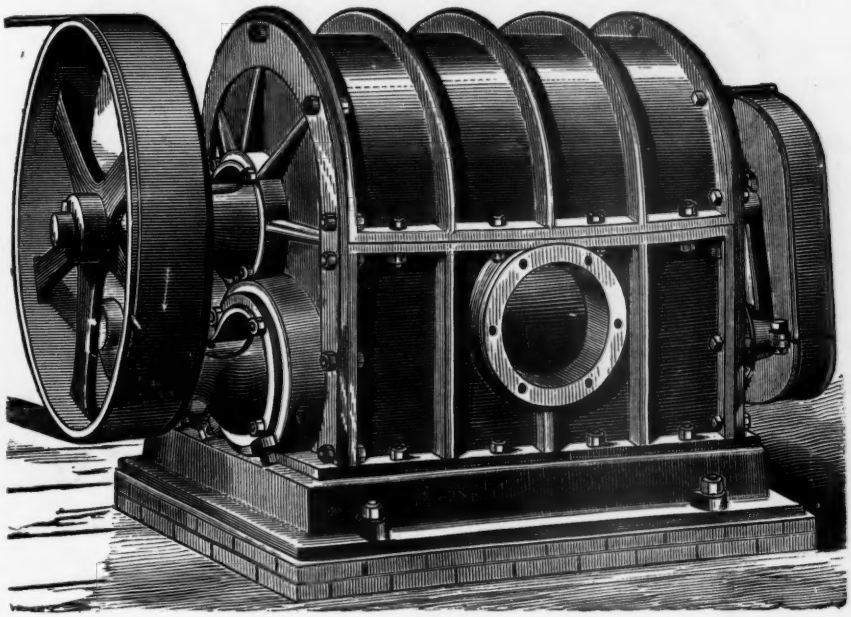
BOSTON, MASS.

91 Liberty Street, NEW YORK. 135 N. Third St. PHILADELPHIA.
16 S. Canal St. CHICAGO. 75 Queen Victoria St. LONDON.

STOCK CARRIED AT BRANCHES.

The Baker Rotary Pressure Blower

ONLY ONE BELT IS REQUIRED TO DRIVE THE LARGEST BLOWER.



The Best POSITIVE PRESSURE BLOWER for IRON FOUNDRY CUPOLAS, Pneumatic Tubes, Water Gas Works, Smelting Silver, Lead, or Copper Ores, Sand Blast, Forge or Knobling Fires, Ventilating Mines or Tunnels or any other purpose requiring a POSITIVE BLAST OR EXHAUST.

Wilbraham Baker Blower Co.,

2518 Frankford Ave., PHILADELPHIA, PA.

THE APEX
OF
Bicycle Perfection

is represented in the Monarch. All the bicycle goodness that the best bicycle makers know is incorporated in this king of wheels. No chronometer could be made with more care, or with greater accuracy. Every part of the

Monarch

is in perfect harmony with all other parts. So perfect is the distribution of weight, so accurate the adjustment of gear, that the Monarch will outspeed, outlast, outrival, any wheel on the market to-day.

Made in 4 models. **$80** and **$100.** For children and adults who want a lower priced wheel the **Defiance** is made in 8 models, **$40, $50, $60** and **$75.** Send for the Monarch book.

MONARCH CYCLE MFG. CO., Lake, Halsted & Fulton Sts., CHICAGO.
83 Reade St., New York.

DIRECTORY OF LEADING PIG IRON DEALERS.

HUGH W. ADAMS & CO.

Pig Iron Merchants

15 Beekman Street, NEW YORK

Boston Office, 85 Water Street

HENRY H. ADAMS & CO.

(Incorporated)

PIG IRON

Sole Agents for the Celebrated "NORWAY," for combined Strength and Softness.

177 Broadway,
NEW YORK CITY, N. Y.

MATTHEW ADDY & CO.

CINCINNATI, ST. LOUIS.

Agencies,

Chicago, Detroit, New York,
Philadelphia.

CLINTON IRON & STEEL CO.

Manufacturers of the

CLINTON INSPECTED FOUNDRY IRON

CELEBRATED "CLINTON" SOFTENER

PITTSBURG, PA

15 Cortlandt St., NEW YORK.

DAYTON COAL & IRON CO.

(Limited.)

PIG IRON.

DAYTON, Tenn. CINCINNATI, Ohio.

F. A. GOODRICH & CO.

Incorporated

PIG IRON, STEEL, COKE, ETC.

Detroit, Mich.

PICKANDS, BROWN & CO.,

Manufacturers, Importers
and Dealers in

PIG IRON AND IRON ORE.

Rookery Building, CHICAGO.

ROGERS, BROWN & CO.,

CINCINNATI, CHICAGO,
BUFFALO,
PHILADELPHIA, NEW YORK
ST. LOUIS

SLOSS IRON & STEEL CO.

BIRMINGHAM, ALA.

SLOSS PIG IRON

D. L. Cobb, Sales Agent

1145 Monadnock Block, CHICAGO, ILL

ESTABLISHED 1875

STOW M'F'G. CO.

BINGHAMTON, N. Y.

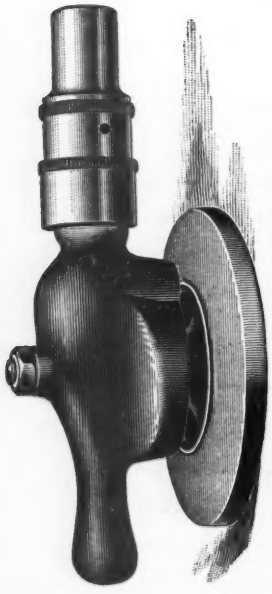
Inventors and Manufacturers of the

Stow Flexible Shaft

—FOR ALL PURPOSES—

Emery Grinding,
Wood Boring,
Drilling, Tapping,
Reaming, Etc.

PORTABLE EMERY GRINDER.



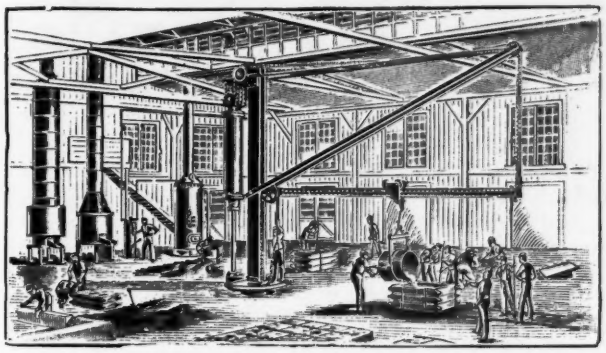
For no tool we manufacture has there been so rapidly increasing demand as for our Portable Emery Grinder. It is giving perfect satisfaction to hundreds of our customers. For cleaning and grinding heavy castings, for buffing and polishing all metals and glass it is almost indispensible, and a great time and labor saver The above cut shows the tool running emery wheel on edge—below we illustrate our appliance which is to be substituted for the clamp spindle when grinding, shaping and polishing flat surfaces.

Write for Catalogue and Price List.

STOW M'F'G. CO

BINGHAMTON, N. Y.

"Ridgway, Your Goose is Cooked!"



5-ton Steam-Hydraulic Crane in a Foundry.

Is what we said to ourselves one day last week as we saw our establishment ablaze right merrily—too deuced merrily.

But the Fire Devil suddenly recollected that this country only had one plant where the Ridgway Crane was made, and having taken the top off our Foundry very considerately stopped and went out, and came and apologized saying:—

"My goodness! Ridgway, is it you? I beg your pardon. I thought I had one of those other fellows. I wouldn't hurt you for anything. You are doing too much good for the country with that Crane of yours. Excuse the inadvertence this time. I'll never do so any more."

We hope he won't.

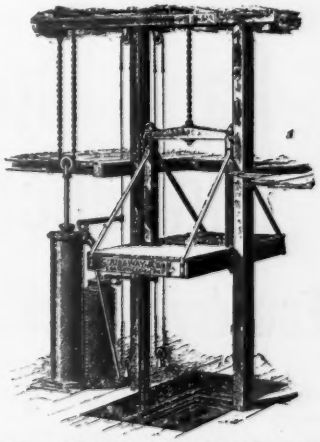
So, newspaper reports to the contrary notwithstanding, we are not burnt out. Didn't lose a pattern. Ran a heat next day as usual, and are still turning out Cranes and Elevators with the same jolly old-time hum.

So send along the specifications same as ever and we will name our regular low prices, and if you want the machines will make the same prompt deliveries.

However, it is not orders we advertise for. Never yet in our advertisements or by word of mouth asked anybody to buy our machines. We only ask that you investigate it a little, and see if it is the money maker we say it is—if you will do that, the ordering part will take care of itself.

"PLEASE TAKE THE ELEVATOR!"

You certainly would if you realized what a machine it was.



Steam-Hydraulic Elevator, also made direct acting with cylinder under platform.

Craig Ridgway & Son,

COATESVILLE, PA.

JOHN J. SHIPHERD, Pres. W. RUSSELL, Vice-Pres. and Mgr.
L. C. SHIPHERD, Sec'y and Treas.

THE

Phoenix Iron Works Co.

The following is a letter which was sent to us unasked for and is a sample of many genuine indorsements which we receive very frequently.

OFFICE OF
BERT. L. BALDWIN, M. E.
CINCINNATI, O.

PHOENIX IRON WORKS CO.
CLEVELAND, OHIO.

GENTLEMEN—As you may remember, you furnished a 10 ton traveling Crane which was erected at the Cummingsville Generating Station for the Cincinnati Street Ry. Co. This crane was erected for the purpose of handling the heavy parts of the Railway Generators. The easy working of this crane was appreciated by the party, who had the contract for erecting the generator, who found that where it required eight men at the hoisting chain of one of our other cranes, it only required three at your crane, with both cranes handling the same load. All of the details on this crane are well worked out and substantial, so that I expect that it will continue to give us the best satisfaction.

Yours respectfully,
(Signed) BERT L. BALDWIN.

MANUFACTURERS

Hand, Steam, Belt, Hydraulic and Electric Cranes

FOR ALL PURPOSES.

Foundry Ladles, Chains, and General Machinery

WASON STREET.

CORRESPONDENCE SOLICITED.
WRITE FOR CATALOGUE.

CLEVELAND, OHIO.

Eastern Office: HARRY W. JENNINGS, Agt., Fulton and Cliff Sts. NEW YORK, N. Y.
New England Office: THE JOHN WALES CO., 139 and 141 High St. BOSTON, MASS
CHICAGO OFFICE, 1430 OLD COLONY BUILDING.

Just Enough Wind

and at the right pressure for the best results is what you obtain with a

Roots' Positive Pressure Blower

OUR CATALOGUE is Interesting.
OUR TESTIMONIAL SHEET Convincing.

Write for Them

P. H. & F. M. Roots Co.,

Connersville, Indiana.

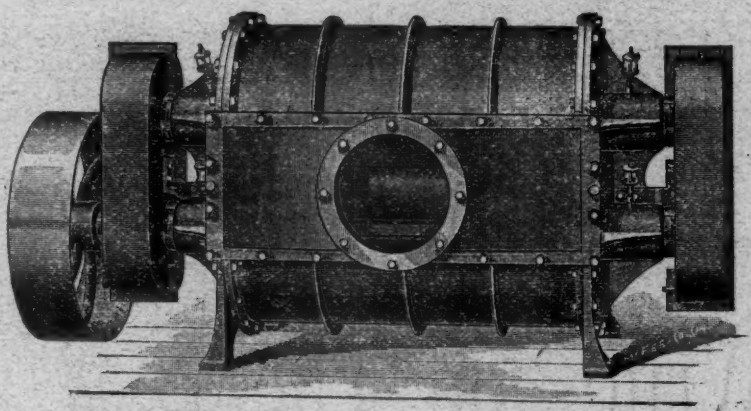
OVER

25,000

Roots' Positive Pressure Blowers

Have been put on the market.

—1859—

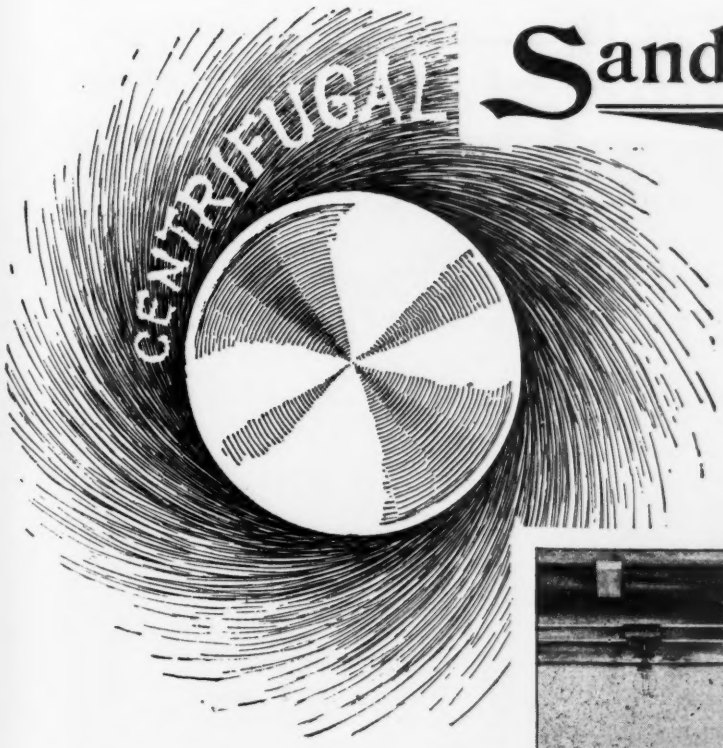


—1896—

They are Unequalled.

P. H. & F. M. ROOTS CO.,

CONNERSVILLE, IND.



Sand Mixer

IT IS
EFFECTIVE
EXPEDITIOUS
ECONOMICAL

IT SAVES
TIME
LABOR
MONEY

A new, simple and practical method of **preparing Sand for Molds or Cores,** superseding the old time methods of drying and riddling. Damp Sand is in just the proper condition for working.

The saving in labor alone soon repays the cost of the apparatus.

☞NOTE.—We have used this new appliance in our foundry for more than two years with great satifaction; other large establishments have obtained machines from us, and we are now prepared to offer them to foundries and to give full information on application to . . .

William Sellers & Co., Incorp.

PHILADELPHIA.

The Edw. P. Allis Co.

Milwaukee, Wis. have the largest foundry (exclusively for machinery castings,) in the United States. Its interior is shown by the following cut. . . . .

The daily melt is from 60 to 90 tons. All the heavy work is done under and handled by **THREE** thirty ton

Shaw Electric Traveling Cranes,

The first of which was put in operation in 1889, the second in 1891 and the third in 1893. Besides these, there are three more Shaw Cranes in the erecting and machine shops.

These Crane are Made Only by

THE SHAW ELECTRIC CRANE CO.

MUSKEGON, MICH.

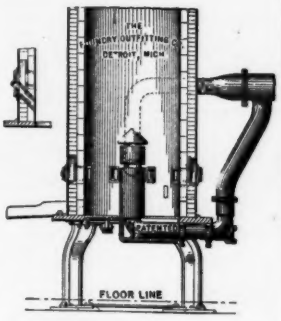
——And Sold Only by——

Manning, Maxwell & Moore,

424 TELEPHONE BUILDING, PITTSBURG.

60 S. CANAL ST., CHICAGO, ILL. **111 LIBERTY ST., NEW YORK.**

Cupola Furnaces
Blowers
Cranes
Compressors
Hoists
Elevators
Foundry and
Core Oven Cars
Ladles



Reservoirs
Tumbling Mills
Core Ovens
Sand Sifters
Brass Furnaces
Testing Machines
Trolley Tracks
Foundry Lights
Flasks
Fire Brick
Fire Clay
Molding Sand

The Wilmington Pipe and Foundry Co

of WILMINGTON, DEL.

ORDERED a 63-inch cupola from us a short time ago, and although it is operated on a slightly different principle from the **OLD STYLE** cupolas, as supplied by all other makers, they find that with only nine ounzes of blast, it keeps all hands busy getting the iron away, and hot iron, too, and don't you forget it.

Hot enough to run Stove Plate.

THE QUESTION IS, What will this Cupola do when it gets 14 ounzes?

They are enlarging their shop already to find room for the molds.

THE FUNNY THING ABOUT IT IS, that this cupola has no outside tuyeres at all, only one-sixth the tuyere opening of the ordinary 63-inch cupola.

IT WILL MELT

MORE BETTER HOTTER IRON WITH LESS FUEL AND BLAST

THAN ANY STYLE EVER BUILT.

MORE NEXT MONTH.

The Foundry Outfitting Co

DETROIT, MICH.

Whiting Foundry Equipment Co.

1522 Monadnock Blk. CHICAGO.
Works, HARVEY, ILLS.

THE WHITING CUPOLA.

An economical and efficient melter of iron. Well made, Modern, Substantial.

Our circular tells about it.

Cranes

Electric, Steam, Air, Belt, Hand,

JIB AND TRAVELING,

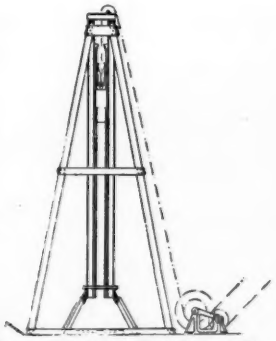
for every purpose. Send for **Crane and Air Hoist** circular.

CASTING BREAKERS

AND

DROP TESTING MACHINES

For all classes of work.
Send for prices.



TUMBLERS . SAND SIFTERS
LADLES . ELEVATORS . TRUCKS . TURNTABLES.

THE FOUNDRY

VOL. 7. DETROIT, MICH., FEBRUARY, 1896. No. 42

A Furnace Plant in Alabama.

By "ENGLASIA."

Located near the center of a tract of 1,720 acres, which was once the Hawkins cotton plantation, stands the furnace plant of the Pioneer Mining and Mfg. Co., and their little town of Thomas, Ala.

The old plantation offered many natural advantages for its selection as a furnace site, and its landscape beauties and picturesque surroundings add much to the appearance of the town, which, with its broad streets, brick houses, churches and schools, prepares the visitor as he steps off the train at Thomas station for the well kept and magnificently equipped furnaces.

Passing down one of the main streets, on which stands the handsome brick Presbyterian church, built for the use of the employes, one notes several hundred houses with ample garden room to each, and reaches in a few minutes' walk the large coal shute and coke ovens.

Fig. 1 shows one of the company's locomotives placing a train load of coal on top of the shute, the railroad cars having drop bottoms for the rapid dumping of the coal. The ovens, 400 in number, are built in batteries of fifty each, twenty-five on each side and from which tracks are laid to the coal shute, from which the coal runs through hoppers into the coke larries and is then drawn by small locomotives to the ovens and poured into them as needed (see Fig.2). The coke after being drawn from the ovens is loaded into the charging cabs or cars (see Figs. 2, 3 and 4) and passes over the incline to the top of the furnaces and is there dumped automatically on the center of the bell, insuring an even distribution of the same in the furnace.

This method of handling coke and other stocks of ore and limestone is the invention of Mr. Edwin Thomas, the president of the company. By referring to views 2, 3 and 4 the "modus operandi" is at once apparent; the charging car or cab passing from the scales to the foot of the incline is caught by a monkey or iron car running on an inside

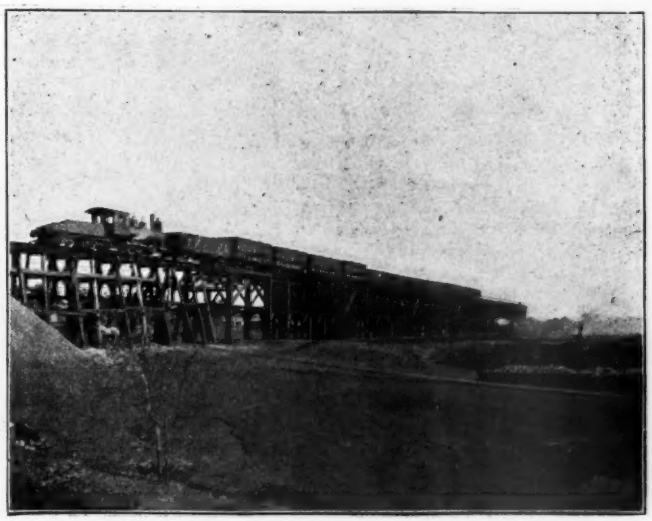


Fig. 1

track, which car or monkey by means of a wire rope carries the load to the furnace top, at which point the roller levers on each side of the charging car are raised by the stationary arms as shown in Fig. 4, the return of the car being insured by the air piston seen in the illustration, forcing it over the level and back to the monkey which speedily carries it to the foot of the incline.

After the return of the cab, the monkey glides on the inner track under the floor of the stock house, while the cab on its track passes back to the ovens or stock piles for another load. The ropes which pull the

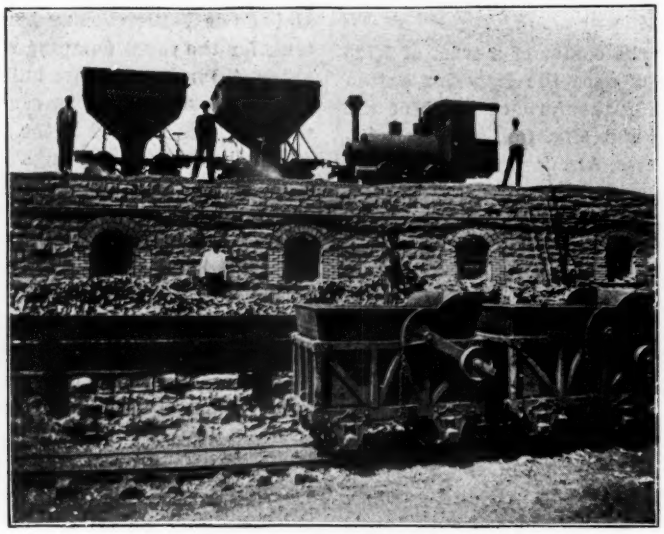


Fig. 2

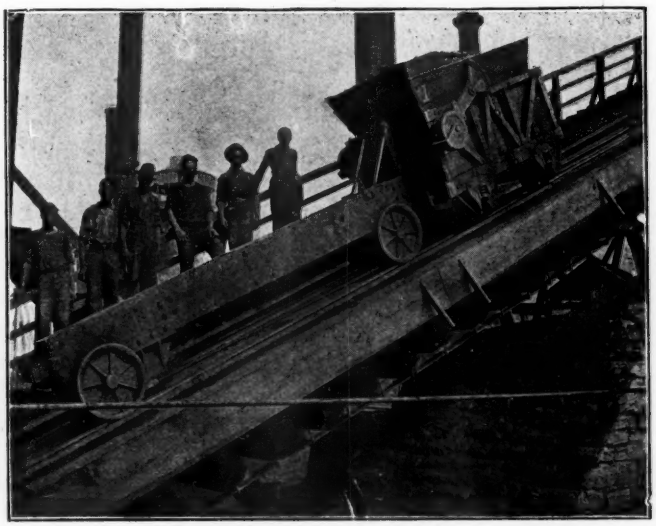


Fig. 3

monkey can be seen in Fig. 6, showing how they pass from the top of the furnace back to the sheave (seen below the ascending car in Fig. 6), thence to the drum of a hoisting engine in the room below, the levers of such engine being operated by the top man, who from the little house seen in Fig. 7 can at all times see the charging cars as they arrive at the foot of the incline, and by a movement of the throttle levers speedily transport them to the furnace top. All the stock is charged is this manner, the cabs being fitted with drop bottoms. In Fig. 5 can be seen the approach to the stock house, a building 640 ft. long and containing at all times from 20,000 to 30,000 tons of ore and limestone. The tracks

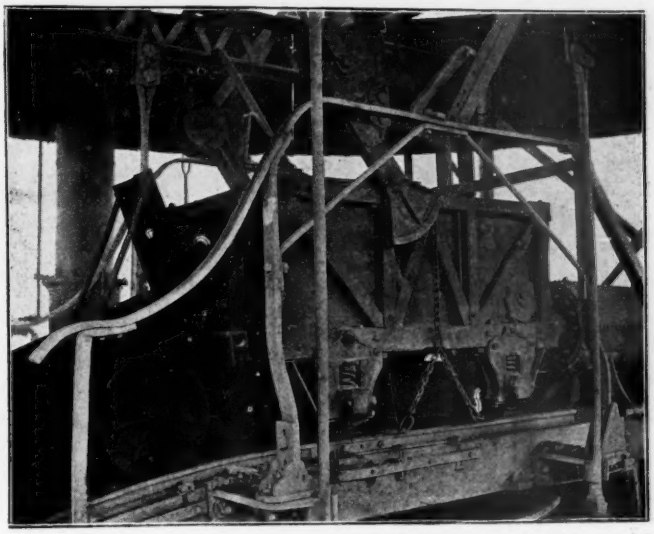


Fig. 4

Fig. 5

seen in the cut pass over iron columns, and from these tracks the railroad drop bottom cars unload their contents rapidly on to the floor below, from which floor it is in turn loaded into the charging cabs, and they in turn pass to the foot of the inclines over the different tracks laid to the various kinds of ore, stone and coke.

The furnaces themselves are 17x75 feet, and are each equipped with four Siemen Cowper hot blast stoves with Hartman's latest improvements, and independent draught

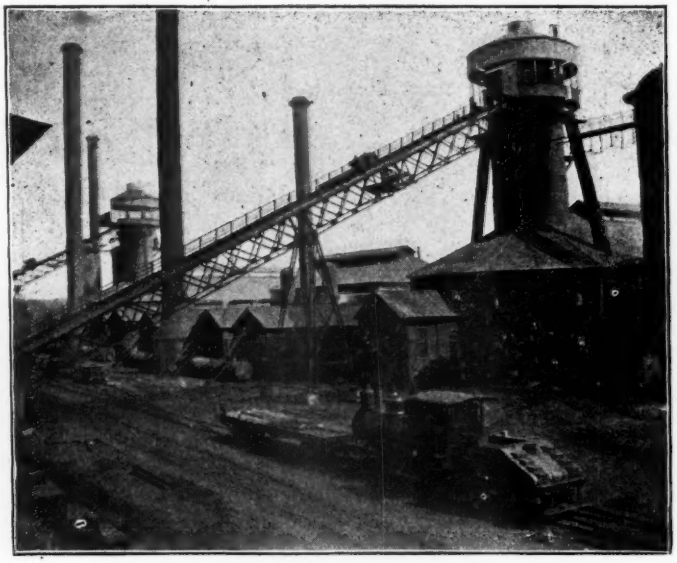


Fig. 6

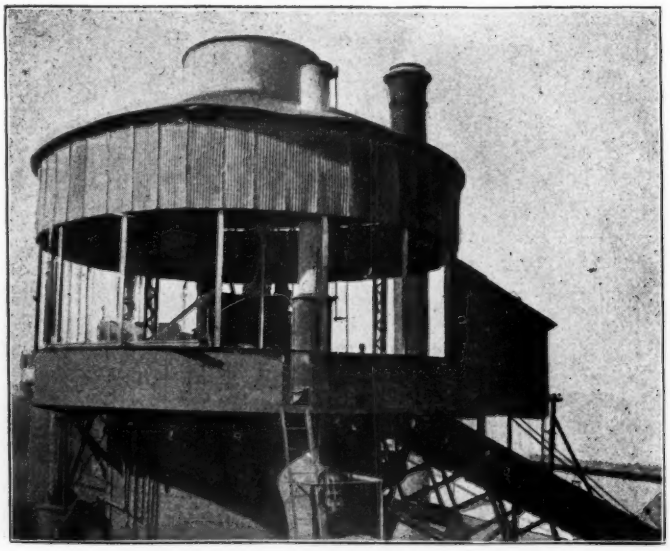


Fig. 7

stack, 9'x150', for each set of stoves. The blowing power for the two furnaces is furnished by six I. P. Morris beam engines of 1,000 horse-power each, with air cylinders 84 inches diameter and 84 inch stroke and steam cylinders 60 inches diamater and 84-inch stroke.

The boiler plant consists of 64 boilers in batteries of 8 each, or 32 to the furnace, with independent draught stacks 9x150 feet. Each battery being equipped with heaters and feed pump, see Fig. 10.

The water supply is furnished by 4 Wilson Snyder duplex pumps, of a capacity of 1,000 gallons per minute each, pumping into a

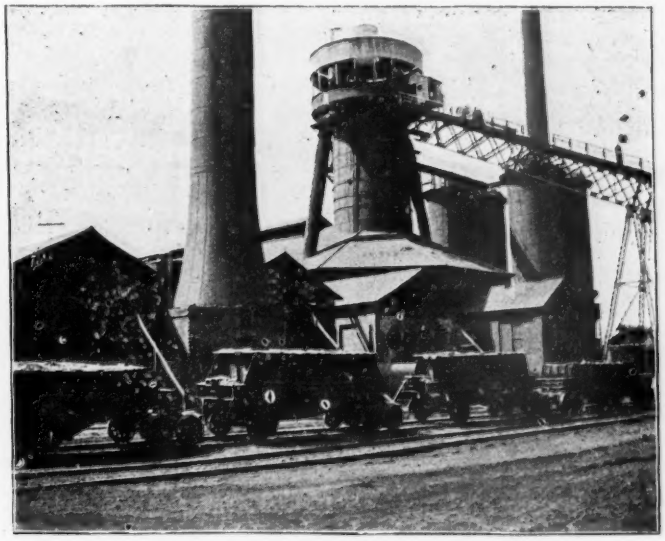


Fig. 8

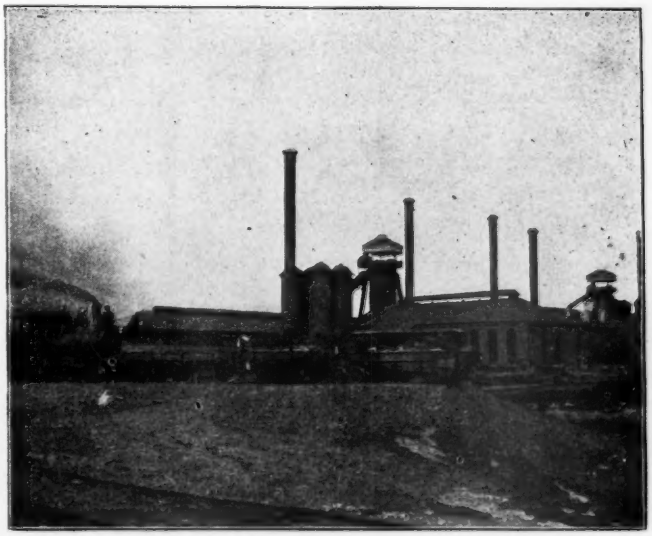


Fig. 9

stand-pipe 125 feet in heighth, affording ample pressure for furnace needs and town protection and supply. The water is pumped from the lake seen in the foreground of Fig. 12, which receives its supply by a canal fed from Village Creek, a stream that flows through the property a distance of nearly two miles. The banks of the lake are being broadened and strengthened by the cinder from the furnaces, which is conveyed in a fluid state, by the cinder locomotive, in the large cinder car pots (of Hartman make), see Figs. 8 and 9. The engine room (see Fig. 11), cast houses, shop and dynamo room are

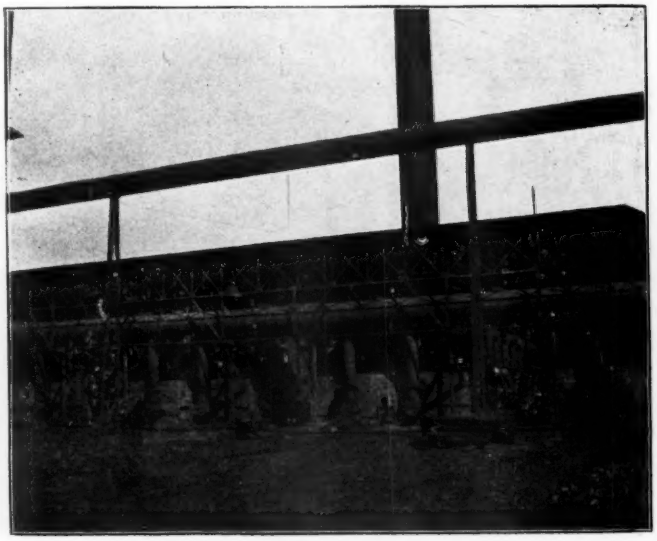


Fig. 10

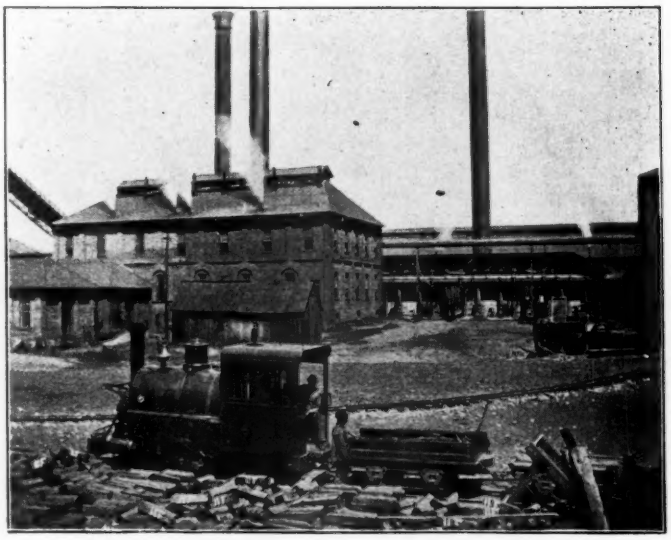


Fig. 11

all substantially built of brick and care is taken to keep them clean. All material is handled as much as possible by machinery, the pig iron being carried to the wharves of the company by locomotives, Fig. 11.

These furnaces have always been run on foundry grades of pig iron and the output of over 100,000 tons per annum is always sold ahead. The ores used by this company come from its Red Mountain mines at Graces Gap and Stephens, Alabama, at which mines they load the red hematite, of which three-fourths of the furnace burden is mixed, with one-fourth of brown hematite mined at Goethite mines of the P. M. & M. Co. The fluxing stone is quarried at Dale, Ala., also the property of the company. This mixture insures a uniform grade of pig, and the Pioneer brand enjoys a reputation for the manufacture of castings requiring strength and finish second to none.

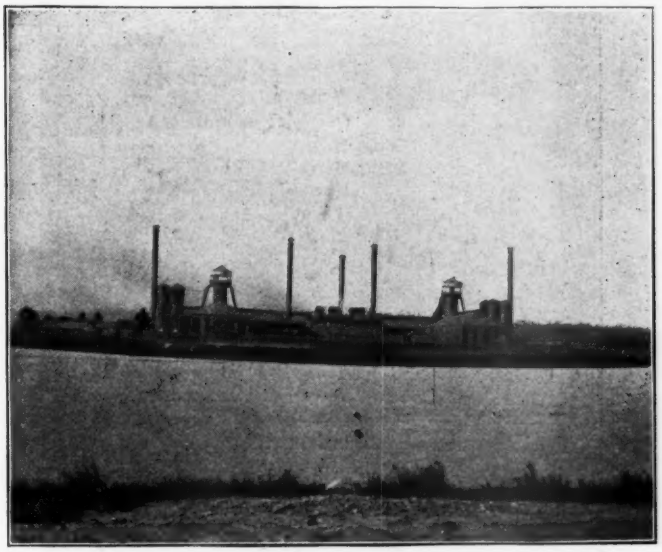


Fig. 12

The Berlin Iron Bridge Co., of East Berlin, Conn., have just completed for the Newport News Foundry Co., at Hampton, Va., a large foundry 40 feet wide and 160 feet long, the central portion being controlled by a traveling crane. This is one of the best and most modern foundry of the southern States.

An Improved Flask Pin.

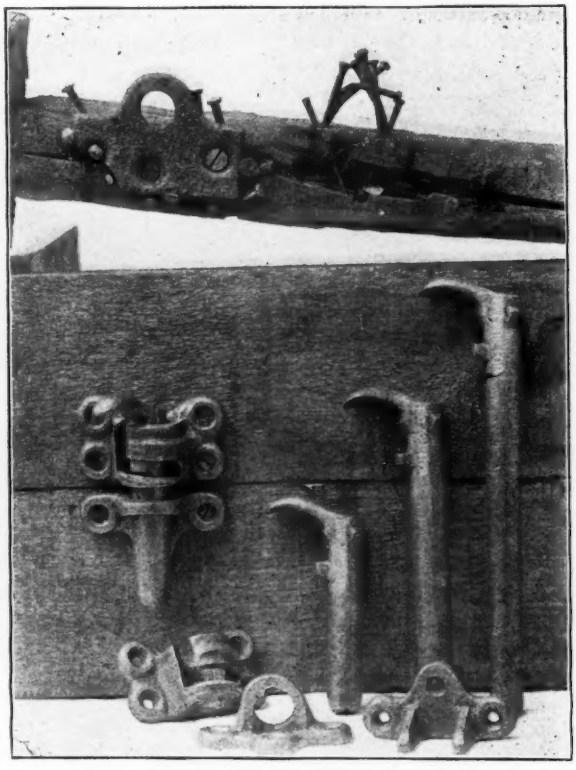
Our illustration shows an improved flask pin, the invention of Mr. Robert Watson, of Cleveland, O., and who for many years has had charge of the foundry of the Columbus Machine Co., at Columbus, O. It is claimed on behalf of this ingenious device by those who have given it a fair test, that it fully answers every purpose and gives the very best satisfaction.

They are so constructed that they can be easily locked and unlocked at will, and when unlocked the pin is loose and readily lifted out.

On the top portion of the pin there are three small rectangular raised sections, made to fit the level part of the circular jacket and another square piece on the pin made to fit the inclined slot in the jacket and the pressure thus caused by turning the pin tightens it up and it thus becomes locked. The pin and its connections are carefully designed to have them as light as possible and strong enough to serve all general purposes. They are hollow, light to handle and stronger than if cast solid. The principal benefit to be derived from their use is that when they have served the purpose for which they were intended they can be easily taken out, leaving

the small connections in the flask out of the way and the flask can be readily shaken out and piled away without destroying it or the pins, as is so very apt to happen with the ordinary style in the way shown by section of edge of flask as shown in cut, a view, by the way, very familiar to foundrymen. Another advantage claimed for pins of this description is that they can be used any length with the same flask connections when it is desired to have long strength lift; and when a flask of three or four parts is required for any kind of work they can easily be affixed to outside of flask while it is being rammed up. The cost of installing this system in the average foundry is very small compared with the results attained. The inventor states that he has placed them on new flasks as fast as they were built and as but a small number of pins are really needed, because of their interchangeability, the cost is lessened considerably.

Those desiring to use this system can secure all necessary information concerning shop rights, or the pins themselves, by applying to The Watson Pin Co., 99 Euclid avenue, Cleveland, O.



An Improved Flask Pin.

Mr. Treacy Endorsed.

In the December issue of THE FOUNDRY Mr. D. F. Treacy, of Davenport & Treacy, Stanford, Conn., replied to an inquirer for information concerning a good mixture with which to cover wrought iron or steel when it was desired to cast it in iron or brass. That Mr. Treacy's suggestion possessed some value is shown by the following letter:

Canton, O., Feb. 2, '96.

Mr. Treacy:

Dear Sir—In the December, '95, issue of THE FOUNDRY you published an article on casting wrought iron or steel in iron or brass.

You asked if anyone tried it to acknowledge it by writing you. I had two rolls to make, 14 inches by 18 inches, with a 4" cold rolled steel shaft in each extending out 11" at one end and 18" at the other, for some new machine they made at a roofing works here. It was necessary to make them without a spot or they would not be accepted. In making the first one I did not think there could be any trouble and was not very particular about it. When poured it blew up and I had to break the shaft out while it was red hot or lose it. That made me think of your plan. I had read it and did not think of applying it until the experience took some of the conceit out. We made the two rolls and there was not a move from the iron and were as clean as any casting could be made. Thanking you for your information, I remain,

Respectfully yours,

JOHN L. BARRY,

Foreman Novelty Iron Co.

The Philbrick Process of Making Wrought Iron Castings.

Metallurgists, and especially foundrymen, are likely to be interested in what is known as "The Philbrick Process of Making Wrought Iron Castings," described in a recent issue of the Iron Age. It is being introduced by the Standard Iron & Steel Co., of 122 West First street, South Boston, Mass.

The process consists in melting in a modified Siemens Martin furnace, using crude petroleum, of 20 per cent. pig iron, 78 per cent. of wrought iron scrap, and adding to this, after it has reached the fluid state, 2 per cent. of a certain composition. These proportions may vary either way, according to the quality of the metal desired. In other words, by changing the proportion of the pig, scrap, and of the composition, the resulting casting may be made to vary in its physical characteristics. The metal is stated to flow very perfectly and to produce a casting practically free from blow holes. The metal has a shrinkage of ¼ inch to the foot.

A casting of this metal can be forged as wrought iron, welded without trouble, and under the cutting tool exhibits the characteristics of soft steel. In the engraving, Fig. 1, the first view represents a single chip. The second view shows how the metal can be heated and drawn down under the hammer, and bent in any desired shape. The third view at the left shows, although indistinctly, a welded joint, while the last view represents a specimen of the metal which had been heated and drawn out under the hammer and then turned into a spiral when cold. Figs. 2 and 3 show front and rear views of a trunnion ring and also a crank disk. In the view of the latter shown in Fig. 2 the wrist pin had been chipped all around and then fractured, the aim being to show the grain, which is fine and resembles that of good steel.

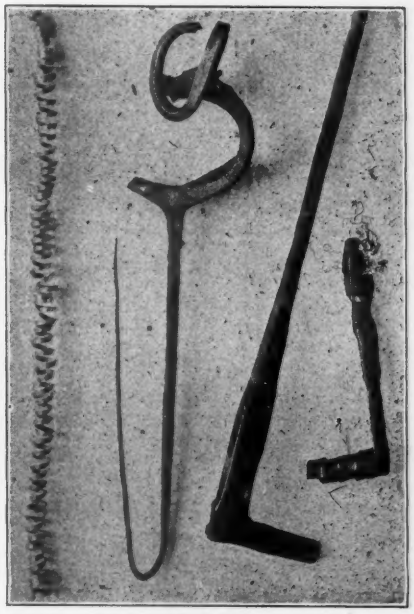


Fig. 1

Specimens of the Metal and what can be done with it.

A test of an unannealed casting, made at the Watertown Arsenal, showed an elastic limit of 29,530 pounds per square inch, and a tensile strength of 60,430 pounds per square inch, the appearance of the fracture being granular. Heating and forging the metal increases its strength, as is shown by a test made at the same place of a sprue which had been forged down to 24⅜ inches in length by 1.13 inches square. The test of this gave an elastic limit of 52,970 pounds per square inch, a tensile strength of 89,600 pounds per square inch, and an elongation in 5 inches of 16.2 per cent., and a contraction of area of 23.5 per

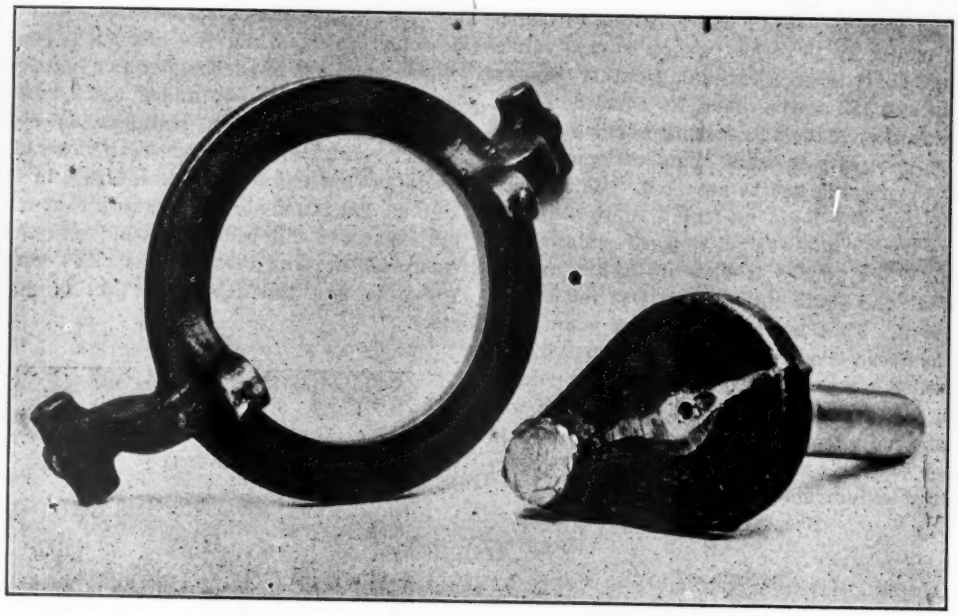


Fig. 2—Ring Crank Disk.

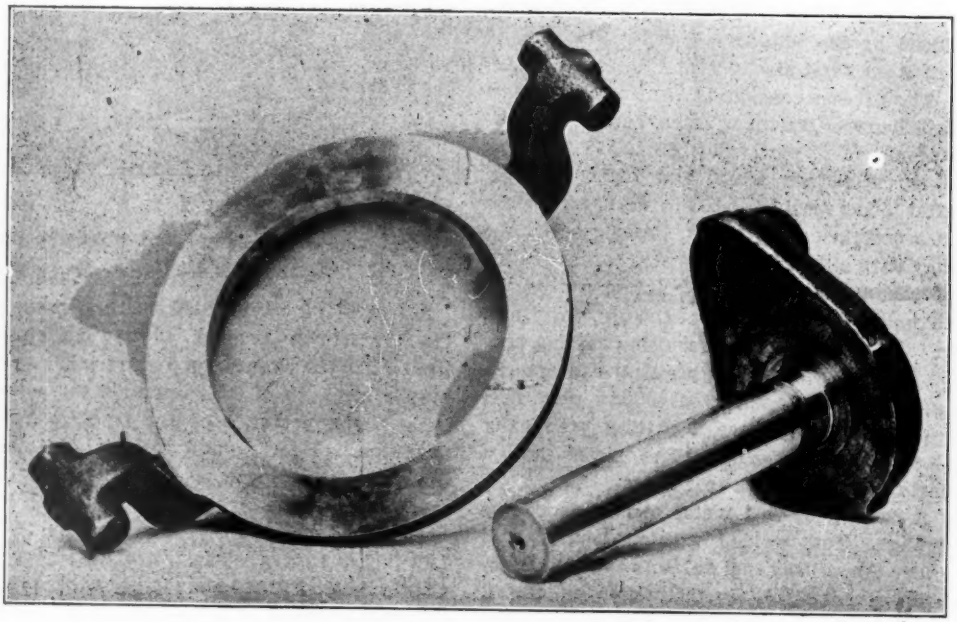


Fig. 3—Reverse of Fig. 2.

cent., the appearance of the fracture being "fine granular, radiating from a dull amorphous center." From a report on this metal made by Levi R. Greene, engineer of the Walworth Mfg. Co., at Boston, we take the following in regard to the electric properties: "Electrically, the metal is proven to have a conductivity exceeding by a large per cent. any other that is in use for electric motors, generators, and other conduits for electrical energy. That per cent., of course, varies with the different metals with which it is compared, but a comparative test made of railway motors by the engineers of the West End Railway Co. demonstrated the fact that the motor having a field of that material was 35 per cent. more efficient than any one of three others submitted in competition by the Edison Co., the Westinghouse Co. and the Eickemeyer Co., of Yonkers, N. Y."

Payton Ladle Carrier.

The illustrations on this page show the invention of Mr. Martin Payton, foreman of the Fuller & Johnson Mfg. Co., and the Gisholt Machine Co. Foundry, of Madison, Wis.

As will be noticed in the cuts, the ladle is mounted on a three-wheel truck, and the molders now take from the cupola twice as much iron as they did when they were obliged to carry the metal by the ordinary method. To make the transportation of the molten iron still easier, a smooth iron floor ¼ of an inch by 3 feet wide was laid in the aisles of the foundry. This carrier has now been used exclusively by the forty molders on all smaller classes of work for the past two years, and not a word of complaint has been heard about it, except from new men coming in occasionally who do not appreciate its muscle saving qualities until they have used it a few times.

The ladles used hold seventy-five pounds and are carried to the floor without any effort whatever, while foundrymen all know that where a molder has to carry his iron from the cupola to a floor that is sometimes one or even two hundred feet away that the effort involved in that one operation alone is most severe and very tiring, owing to the unequal strain on a molder's body arising from its forced position.

Then, again, there is less danger of being burnt, something that the average molder lives in constant dread of.

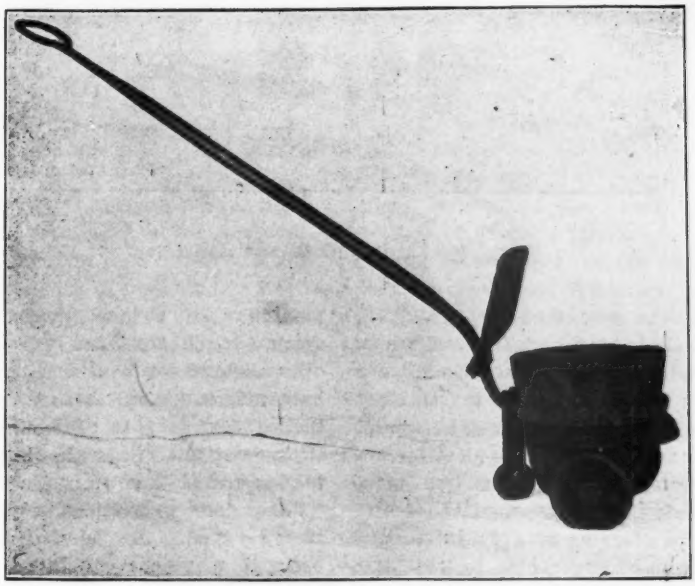


Fig. 1—Ladle and Carrier.

Mr. Payton will dispose of shop rights and furnish samples if requested.

Pokey's Pointers.

More attention is being paid to details in manufacture than there ever was before. The owners of plants are beginning to realize that it is not so much the few large defects which everybody can see with the naked eye, that are causing a passing of dividends, as the many small, to the inexperienced, invisible faults.

But it is probably as unhealthy for a shop to have no leaks at all as it is to have too many. There is such a thing as having too strict a discipline over men in this land, where everybody is born both free and brave. To some employers it is a serious offense when the men find fault with their treatment and surroundings. It should not be so. It is one of the most gratifying signs to have a class of workmen who will, as free men, speak their mind. The importation of serf labor from the domains of a despot to displace men because they choose to kick, has never yielded more than a hundred cents on the dollar.

We have spoken before of the inability of Wilbur to handle men without causing friction, and Pokey is the same way himself. If he should undertake to run the foundry he wouldn't have anybody left at the end of a week except a half-crazy fellow who is mixing facing sand. Everybody likes to get a job at bossing, and they all claim that they can boss all right. They undoubtedly can, too much so, in fact. A boss that cannot give orders without causing the recipient to put on his coat and quit is a mighty poor one, no matter how competent he may be on mechanical matters. To do work one's self and to have others do it are two different things. A man may be a good mechanic, and still amount to nothing when it comes to handling others. It takes considerable contact with humanity in general before one masters the tactics necessary to conduct men through their daily toil without having to put on the brakes and slow down.

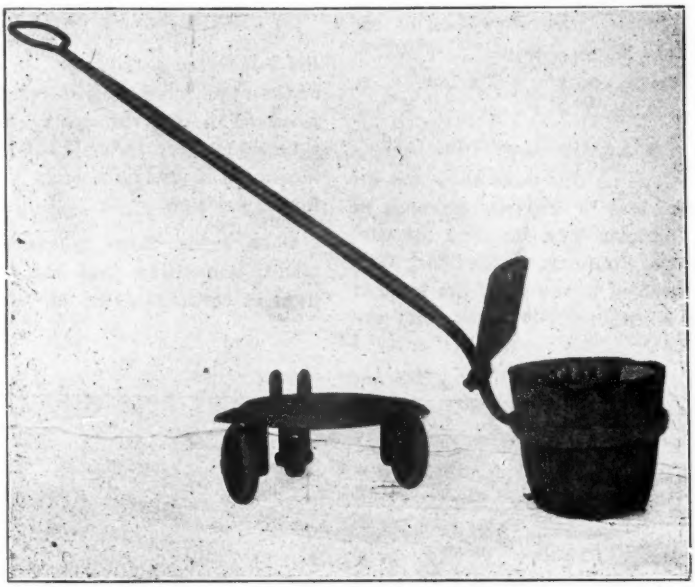


Fig. 2—Ladle and Carrier Separate.

Pokey came over to the shop yesterday and in a very curt way asked the first man he came to where he could find Bowers. "Up by the stable is the last place I seen him," said the man, as he gave a nod in that direc-

tion, where a cloud of dust attested to the fact that someone was stirring up things. At Pokey's when anything is missing the first place to look for it is somewhere around the stable, as this is a general dumping ground for everything. It is a depository for patterns as well as horses, and Pokey started towards it as if he was in a hurry for something, and one of the boys remarked that he acted as if he was going out of business tomorrow. He could not have run against Tom Bowers at a more inopportune moment. If you ever want to get on the right side of a foundry foreman don't approach him while he is hunting for a pattern that he is unable to locate. Better talk to him through the telephone if you don't want to go away with a broken heart. Pokey reached Tom just as the latter had moved a big stack of dusty patterns without finding what he was after, and if it hadn't been that Pokey owned the darn place, as Tom put it, it would have went hard with him.

"What are you looking for, Tom?" began Pokey.

"A valve bushing."

"Can't you find it?"

"If I could I wouldn't be looking for it, would I?"

"How is it, Tom, that half of the time I run against you you are on your ear?"

"Because I have got a reason to be, Pokey. Here you are with the patterns for thirteen different sizes of engines, eight steam pumps, four complete sets of heating apparatus, power transmitters, jobbing work patterns belonging to different firms, who are continually calling for them, and all the place you have to give such an assortment is a space over your stable full of dust and straw. Now I want you to take a little of my advice. Move out to Kansas, where ground is cheap, if you can't afford to put up shelves and apartments. If you must have everything on the floor move some place where you can afford to spread yourself out. A place for everything and everything in its place has always been my motto, but here it is, no place for anything and everything out of place."

"You have had your say, Tom, and I want to have mine. Mr. Wilbur tells me that a great many of our molders are turning out castings for themselves without paying us for the privilege. Mr. Wilbur states that he personally observed Bill Nye carry away a stove top the other night, and I have hunted high and low on our order book without finding any mention whatever of such a job coming in. I want to find out who is to blame for this condition of affairs. I am collecting evidence. Will you please tell me what you know about it, Tom?"

"The molders occasionally make a few small castings for themselves, a stove leg or a grate, once in a while a shoe last or some ornamental bric-a-brac weighing a few pounds."

"They do, eh, without paying for it, Tom?"

"Yes, sir."

"Do they do so with your consent?"

"Yes, sir."

"I never thought you would allow such a thing as that, Tom. Here I am paying you to look after my interests and here you are acknowledging that you allow the molders to carry my property away without remonstrance. You must stop this immediately, Tom, or I shall be compelled to make a change."

"Go ahead and make it."

"You are a queer man, Tom. Now you are talking as if you felt that you had acted perfectly right in this matter and as if these men had a right to pack my property away on the installment plan."

"I have acted honestly about it."

"How can you talk that way, Tom? Those men receive their wages in full. They have no right to anything else."

"Such things are not always a question of right. If you were a barber and working in a shop, how would you like to pay for the privilege of shaving yourself? When you pay your grocery bill and are presented with a Havana cigar from Wisconsin, you are tendered this, not because you have any right to this kind of treatment, but because it is a good policy for the grocer to have you satisfied."

"Go ahead, Tom. I want to see how you are going to twist the tail of this subject to make it justify your opinion."

"Instead of buying a cigar, as you should do, Mr. Pokey, you say to yourself, I will step over and settle up with Mr. Coffeecounter, and then I won't have to buy a smoke. You have got no right to expect anything of the kind, and still you would get hopping

mad if you didn't get a small present for paying your just debts."

"How do you know I would?"

"Never mind. Your wife is the same way. If the groceryman should forget to give, give, mind you, the children some candy, how quick she would tell you to trade some place else. There are certain things which we have no right to and yet expect them. If it is worth something to the merchant to have your good will, it is also worth something to you to retain a set of decent workmen."

"Yes, but if every foundry would put a stop to such a practice, it would be just the same."

"Yes, and if every grocer would stop giving presents it would be all the same, too. But this 'if' is in the way. If it wasn't for the 'ifs' what a lot of money there would be in the foundry business. It pays to grant the men a few privileges, even though it does take a few dollars off the profit. And, speaking of Mr. Wilbur reminds me that he charged a man fifty cents last week for using the planer at noon time, when the machinery was running anyhow. 'He had no business to be doing so,' is what Wilbur said. The next day this man passed by the storeroom and found the faucet open on one of the oil barrels, left that way by the absentminded boy who is supposed to look after it. What did this man do, shut it off? No, sir, just let it run, because he had no business to be tending to anything else but his own work. Now what did you make from those fifty cents, when you count the loss of twenty gallons of oil? It is all well enough to tell a workman that he shall tend to nothing but his own business, but I want men to take sufficient interest in the welfare of their employer to use a little judgment when anything goes wrong, and not wait to be told before they act."

"Wilbur was right, anyhow, Tom. He did this for a principle."

"Yes, and there are many principles in shop practice that cost more to keep in repairs than their total earnings amount to. As far as the molders are concerned, I want to tell you one thing. We don't lose much, they do the work in their own time, they usually leave an old casting of about the same weight as the one they take away, so that about all they get from us is what little coke it takes to melt what metal they need. And here is another side to it. When a molder undertakes to make a piece from some old, broken casting he is gaining in experience, so that what we lose in iron and coke we gain in skill, and you may not think this is worth anything, but it is."

"Say, Tom, where is Joe Spencer this morning? Never knew him to miss a day before."

"He quit last night."

"What is he going to do now?"

"Got a job at the Enterprise and fifty cents a day more than what we were paying him."

"Too bad, Tom. Look a here, we can pay better wages than the Enterprise. Why didn't you raise him so that he would have stayed here?"

"Ain't you getting absentminded, Pokey?"

"I guess not, why?"

"Two months ago I went to you and suggested that we raise Joe's pay. You remember what you said then?"

"I don't recollect."

"You wanted to know if Joe had asked for more pay, and when I told you he hadn't you turned around and said that it should be considered a bad policy to raise a man's wages, unless he asked for it."

"Well, why didn't the darn fool ask for it, then?"

"Because some men are not built that way. They believe that if they are entitled to any increase at all, that they should also be given the same without making any special application for it."

"Tom, I can't come out to the foundry without finding a pointer waiting for me. This is the first time I have heard of this kind of people who won't ask for a raise when they know they are worth it. It surprises me, though, that a man such as Joe Spencer, and as well as he knows us, should deliberately leave the place without opening his face about it. Look out hereafter, and if you think a man needs a raise give it to him and ask no questions. It is another of your pointers, Tom Bowers. Whenever you want a man to stay with you make it worth his while to stay, and don't depend on him working for low pay, even if the bears have got the best of the labor market.

C. A. Sercomb, of Schwab & Sercomb Milwaukee, was recently elected vice-president of the National Association of Furnace Manufacturers. If he devotes as much of his time and energy to that body as he does to other enterprises he is connected with they can be congratulated.

A TECHNICAL JOURNAL DEVOTED TO FOUNDRY INTERESTS.

THE FOUNDRY

Published Monthly by

"The Foundry Publishing Co."

DETROIT, MICH.

JOHN A. PENTON,

EDITOR AND PROPRIETOR.

DETROIT, FEB., 1896.

Entered at the Post Office at Detroit, Mich., as second-class matter.

SUBSCRIPTION—One Dollar per year in advance in all parts of the United States and Canada; one dollar and fifty cents per year to all parts of the Universal Postal Union. May be sent by express, draft, money order, registered letter or U. S. postage stamps. Single copies, 15c.

CLUB RATES—Eight or more subscriptions sent at one time, 75 cents per year each. Cash to accompany order.

Advertising rates furnished upon application

SUBSCRIBERS can have address changed as often as desired

IF YOU FAIL to receive your paper promptly, please notify us.

THE FOUNDRY is issued promptly on the 20th. of each month, and will spare no endeavor to furnish valuable news and information to those interested professionally or incidentally in molding, melting, mixing of metals, foundry management, etc. Persons connected with any of these lines of industry will confer a favor upon the Editor of this Journal by sending him news from their section of the country pertaining to the foundry interests, particularly individual theories and experiences of practical value.

The Detroit News Company,

Publishers' Agents, Detroit, Mich.

DEALERS SUPPLIED BY

The Albany News Company, Albany, N. Y.
The Baltimore News Company, Baltimore, Md.
The Brooklyn News Company, N. Y.
The Buffalo News Company, Buffalo, N. Y.
The Central News Company, Philadelphia, Pa.
The Cincinnati News Company, Cincinnati, Ohoi.
The Cleveland News Company, Cleveland, Ohio.
The Colorado News Company, Denver Colorado.
The Detroit News Company, Detroit, Mich.
The Minnesota News Company, St. Paul, Minn.
The Montreal News Company, Montreal, Canada.
The National News Company, New York, N. Y.
The Newark News Company, Newark, N. J.
The New Orleans News Company, New Orleans, La.
The New England News Company, Boston, Mass.
The New York News Company, New York, N. Y.
The Northern News Company, Troy, N. Y.
The Omaha News Company, Omaha, Neb.
The Pittsburg News Company, Pittsburg, Pa.
The Rhode Island News Company, Providence, R. I.
The San Francisco News Company, San Francisco, Cal.
The South West News Company, Kansas City, Mo.
The St. Louis News Company, St. Louis, Mo.
The Toronto News Company, Toronto, Ontario, Canada.
The Washigton News Company, Washington, D. C.
The Western News Company, Chicago, Ill.
The Williamsburg News Company, Brooklyn, E. D., N. Y.
The Wisconsin News Company, Milwaukee, Wis.

Trade Outlook.

Business for the month of February will show a much smaller volume than for January, while the reverse was expected. A curious anamoly exists in this connection.

The specialty manufacturers along standard lines seem to be just as full of business as they can be. This refers, of course, to stoves, agricultural implements, hardware, etc., while those concerns who depend on orders before melting, or even buying their iron, seem to be very slack, taken as a whole. Pipe works and car wheel shops seem to be getting their share, while the general jobbing foundry, as well as builders of engines, machine tools, etc., are not doing as well as they expected, especially in the Eastern States.

Pig iron occasionally gives signs of an increase in price, but the plain fact of the matter every day more and more apparent is that there are simply too many furnaces to permit of the price being maintained at a figure above that of bare profit, while some brands are, as always happens, a trifle in the lead and sold ahead at their own price.

Here is a Pointer.

The reference made by our Chicago correspondent to the practice in that city (and we imagine it is the same elsewhere) of showing a preference to a certain contractor when bids are opened for any piece of work, providing he will meet the lowest figure, if there are from the pleasure it should give to feel that consideration. It is one of those vital questions that arise occasionally and that ought to offer to our foundrymen's associations an opportunity to show what they are made of.

There surely must be some means possible whereby this grave evil may be at least mitigated, and we think that the bodies referred to ought to seize the opportunity and make their influence felt.

The Scrap Heap.

The foundryman who can read over carefully the paper prepared by Mr. R. A. Hadfield for the Philadelphia Foundrymen's Association, without being very much surprised, should stand up so that all may see him.

* * *

That a large and representative employer,

the head of a concern employing many hundred men, and an English employer at that, should place himself voluntarily on record as favoring such a radical departure from established methods is enough to make us all ask ourselves where this thing is really going to end.

* * *

We like to think and have others think that we in America are just a little in advance of all creation in our treatment of employees. That in this country, and here alone, is he treated as he should be and his rights conceded, while his welfare and comfort are carefully looked after. But here comes a gentleman who has visited this country many times, and is an extensive traveler in other lands, as well as a close student of human nature, and a successful manager of men, who advocates a policy that we have been taught is impossible where financial success is desired.

* * *

But Mr. Hadfield says he has tried it, that he has experimented to his own profit, and believes it will pay others to do so.

* * *

He believes it is better to have his men belong to an organization, and thinks that it is only an inferior set of workmen who do not, and intimates quite plainly that employers generally would find it greatly to their interests to establish closer personal relations with their employees.

* * *

He does not wish to convey the impression that a philanthropic motive should be the inspiration in matters of this kind, but, aside from all pleasure it should give to feel that justice was being done, he puts it down to a business basis, and is there content to maintain his position against all comers.

* * *

THE FOUNDRY desires to extend to Mr. Hadfield its best congratulations, and takes the opportunity of assuring him that there are in America many concerns, and some of them large ones, too, in which the employees are shown every consideration, and that in almost all cases it will be found that they appreciate it and that it—pays.

That much agitated and never settled subject of contract and prison labor is creating another disturbance, this time in foundry circles in Tennessee.

* * *

It appears that a certain firm has been leasing the labor of the convicts of the State for 70 cents a day and recently offered to renew the lease for 40 cents a day per man, the State to clothe and feed all convicts and find suitable buildings and guards.

* * *

Naturally the foundrymen of that State and section feel that they ought to have something to say on that subject, and they are giving utterance to their sentiments in a way that leaves no doubt as to their appreciation of such a great injustice.

* * *

It is becoming more and more apparent in this country that this question of convict labor has to be met and settled in a way satisfactory to all the people, and not by some injudicious compromise that irritates certain interests and creates continual discord. Making stoves, hollowware, brooms, shoes, clothing, etc., may seem to State officers to be occasionally a wise plan to follow, but when it is remembered that the State is to a certain extent furnishing the capital and means whereby one competitor may work an injury to the business of other manufacturers in his own county, State or city, who are compelled to meet his prices with the product of honest capital and fully paid labor.

* * *

The system adopted in some Southern States, and one especially, of having the convicts employed when possible in road making, seems to have given the maximum amount of satisfaction over any system ever yet tried.

Krank's Korner.

It is one thing to furnish ideas and say how things shall be done and another to put these theories into practice.

* * *

We were reminded of this by a description of the shop belonging to the author of "How to Slag Out." We knew that practice differed

from theory, but we never did think that there could be such a distance between them.

* * *

Puck's motto, "What fools these mortals be," fits this case loose enough to give plenty of room to stretch in. When a foundryman gets so interested in letting the public know how a model foundry should be made and ideal conditions maintained, that he hires a small boy to sharpen lead pencils for him, we naturally expect to find him laying out some of these same plans in his own shop. When we don't, we place him alongside of the temperance advocate who drinks, the clergyman who swears and the lawyer who tells the truth. He will find his resting place in a shop where the fellow with horns touches off the vent.

* * *

Whenever we run across such bad morals the question bobs up, does a man believe what he writes? He reminds us of a certain party that is getting out patterns and selling shop-rights, and these same patterns are made to sell and not to use. We know newspapers sometimes run short of truthful matter and make accidents to order for fifteen cents apiece, but why should a foundryman do the same way? If we believe what we say and have faith in what we write, why do we not act accordingly? Are we liars or fools?

* * *

The facing man does claim a purity for his wares akin to snow, and we overlook his faults after paying his bills. The pig iron man will shove his silicon up and make us believe that his iron is a scrap carrier and a softener and after having a scrap with the foundry foreman and being soft enough to be taken in, we ask no questions why these people are thus, because the motive is plain. They do it for the eagles we pay them, and then we get even by imposing on others in turn.

* * *

But why a foundryman should take the pains to figure out how a shop should be run to make money and then go and steer his own shop in an exactly opposite direction, is what we want to know. We are getting stoop-shouldered looking for a key to this Egyptian puzzle. We are in search of a kind of flux that will make this thing go down. If there is money in preaching one thing and practicing another, we want to know it, so that we can shut down thirty days and get on the right track.

* * *

The press occasionally repeats the statements made by a couple of prophets, who became such under the soothing influence of two for a quarter drinks and in that condition thought they beheld an expansive view of the future to the effect, so one said, that cast iron was doomed to be banished from the use of man by steel, while the other, who had evidently drank more, went one better and claimed that iron and steel both would in a few years become extinct and be crowded to the wall by aluminum.

* * *

These statements came from the same box that produced the prophecy about the disappearance of the steam engine when electrical power appliances first showed themselves. To-day there are more steam engines in use than ever before and their disappearance is indefinitely postponed.

There is hardly a thing discovered that does not serve some useful purpose. The consumption of aluminum is greater than ever before, that is true. How about steel? Same thing, only more so. How about iron? Don't have to say. The number of foundries going into business tells the story. You don't see any iron foundries standing idle, crowded out by either steel or aluminum.

Every metal has its use and is performing its proper function. Sudden changes fail to arrive as predicted, because the hurace does not move suddenly. It takes its time and finds out where it is going first.

Pittsburg and Vicinity.

In some lines of the general iron and steel trade there is an increased activity and somewhat better prices. While there is not a "boom" indications seem to show that the improved conditions are permanent and that a better era of trade is close at hand. What little improvement is noticeable is no doubt partly due to the announcement of the restriction of the iron ore production for the coming season, and also to the growing impression that the regular rates for coke are to be upheld and maintained.

What is most particularly desirable is to have the advance in raw material extend through the finished material.

As yet the latter has not answered to the rise in raw material, but the events of the past few weeks show that this is being done. Indications point to a better trade in all lines. Mill irons are in pretty fair demand and are growing somewhat stiffer in price, but at present the prospects for foundry irons for the next month are not very encouraging. Quite a number of foundries in this vicinity doing general work are only making two small heats per week, when formerly one large heat per day was made. A few have decided to shut down for the present, but it is thought to be only temporary.

The general trend of business is upward and toward higher prices. The policy of holding on for something to turn up is still being pursued, but the market is, without a doubt, showing up something definite. It will take little to push the market along, hence there is some expectation the near future will bring greatly increased activity in all lines and an upward course of prices. Were the financial conditions better the outlook would be more promising. With the present money stringency removed the natural needs of the trade would be sufficient to keep the market in a prosperous condition. Following are the ruling quotations for foundry irons:

No. 1 Foundry	$13 25@13 75
No. 2 Foundry	12 50@13 00
Charcoal Foundry No. 1	17 50@18 00
Charcoal Foundry No. 2	17 00@17 25

Cast Iron Pipe—As the spring approaches the market for cast iron pipe becomes better, the demand for gas and water pipes being of a increasing nature. Prices are also advancing and are being well maintained.

Castings.—Castings for rolling mill work are being called for daily, some heavy orders having been booked by local concerns within a short time. In this line prices have not advanced for some time, but those ruling are being held firmly:

	Cents per lb.
Chilled rolls, up to 12 in. diameter	3¾
Chilled rolls, over 12 in. diameter	3¼
Sand and Homogenous steel rolls and pinions up to 12 in. diameter	2¾
Over 12 in. diameter	2½
V-tooth pinions, additional	¼
Housen and rolling mill castings not otherwise specified @	2
Spindles and coupling boxes	1¾
Squeezer castings	2¼
Squeezer pinions and wheels	2½
Spur and bevel wheels, large	4
Spur and bevel wheels, small	3 to 2¼

Pig Iron.—The pig iron market is fairly active, with prices ruling at 15@15½c for small quantities.

Copper.—The demand for copper does not seem to improve very much, as it continues to rule very quietly. Prices are also quite low, the price being placed at 9¾c for casting.

Pig Lead.—There is a fair demand prevailing for all kinds of lead goods, while prices are about stationary at 3.15c for carload lots and 3.20@3.25 for smaller quantities.

Aluminum.—This market presents a cheerful appearance, as the demand for aluminum is generally good, with fair prices prevailing. No. 1 aluminum, 90 per cent pure, is worth 60c per pound in rolling ingots; No. 1 aluminum, 98 per cent pure, in ingots for remelting, 55c per pound.

NOTES.

The new works of the Homestead Manufacturing Company have been started up. The plant consits of a well equipped foundry and machine shop with all the latest machinery and will turn out the patent "Straitway" valve, for which it has orders enough to keep it busy for six months. W. F. Harrison is superintendent of the works.

The labor troubles at the plant of the Westinghouse Electric and Manufacturing Company, at East Pittsburg, caused by a reduction in wages, have been satisfactorily adjusted by the employes returning to work on the old basis of 24 cents per hour.

The American Steel Casting Company, at Sharon, is enlarging its plant by adding a new building. The structure will be ready for occupancy by April 1.

The Westinghouse Machine Company expects to be in its new plant at East Pittsburg within sixty days, where it will have double the capacity of its present plant.

The A. Garrison Foundry Company, of this city, is building a mill to roll aluminum for the Pittsburg Reduction Company at New Kensington. This train consists of 28x84 roughing mill for breaking down and a 28x84

inch finishing mill of improved design, the housings weighing 30,000 pounds each, and the bed plates 1,000 pounds per running foot of train. The roughing mill is provided with a hydraulic tilting table on the catcher's side of train for manipulating the heavy aluminum ingots.

The Pittsburg Malleable Iron Works will remove to East Pittsburg next summer and the plant greatly enlarged. Plans have been prepared and contracts will soon be let for the erection of buildings.

The McVay & Walker Company, of Braddock, has begun the manufacture of patent porcelain-lined bath tubs. A new addition to its foundry has recently been built to make that style of tub exclusively.

The National Galvanizing Company, of McKeesport, has commenced work on the erection of a new plant at Bissell. The buildings are of steel structure and are being erected by Gwinner & Co., of Allegheny, and will be pushed toward completion is rapidly as possible. Contracts for engines, boilers, etc., have already been awarded.

The The Damascus Bronze Company, of this city, has closed contracts for 1896 with a number of the more important railways and has found it necessary in consequence of increased business to correspondingly increase its plant at once. The company has recently put in a 10-ton crane and a new drying oven for large castings.

Plans have been prepared for the reorganization of the Aetna Foundry and Machine Company, of Warren, O. Those interested are Lloyd Booth, H. M. Garlick and Charles Booth, of Youngstown; C. W. Bray, of Lisbon; J. W. Russell, of Warren, and J. Strouche, of Anderson, Ind. The capacity of the plant will be materially increased by the addition of a large amount of new machinery. It is expected that the output will be increased about one-half.

Chicago and Vicinity.

How is business and what are the prospects? are the questions one hears every day. To the former, it might be worse and could be better; to the latter, we are guessing; prices are still low and I can see nothing to cause one to think they will advance.

There is one little feature in the struggle for work that is playing havoc with prices, and that is what is known as preference. For instance, a request is made for bids on a job of work; after the bids are all in, it matters not how many bids there are, or how low the lowest may be, the one having the preference has the chance to bring his figures down to the lowest bid, and get the job. You would be surprised to know how much of this kind of business there is going on.

There have been but few jobs of any consequence let in Chicago of late that some one has not had the preference. This may be business, but it is not honest. When bids are called for, all competing should see that the first lowest bidder gets the work, and not the one who has the preference. This matter of preference not only stifles honest competition but it results in a reduction of the price of work. A man may smile because he has the preference on a certain job by meeting the lowest figure, but in the end he will be the loser. The next time he may not get the preference. If a contractor wishes to get some work done and has a preference why does he not go to this man and get his lowest figure and give him the job? He never does this, and the reason that he asks for bids is to get a chance to beat down the price of the foundry he thinks can make the class of work he wants better than some one else. If a foundryman through his own efforts has got his business down to where he can turn out a certain class of work better than his competitors, he should have a better price for it and is foolish if he does not get it. Again, a man who will give a preference is not honest, and cannot be relied upon. If he will show the bid of a competitor to-day that you may meet the figure, he will show your bid to some one else to-morrow, if he thought he could get a better price. This is not honest competition, and every time a preference is given it results in benefit to the one having the work done and injury to the whole foundry interest. There is one way this evil can be overcome and that is by the appointment of a board of foundrymen whose duty it would be, when work was to be let the party letting it should notify said board, when this board would advertise for bids, to be opened by them in some appointed place, where all bidders could be present, the lowest bidder being awarded the contract. If

the contractor has any objections to the one making the work, to whom the contract is awarded, he can make it known. If the board considers these objections good they can give the contract to the next lowest bidder. This plan may not be practical, but it is suggested to show how by it or some similar method a foundry can make a bid and have it honestly considered.

T. McHugh is putting in a machine shop; will make a specialty of steamfitters' supplies.

The Garden City Fan Co. is running the Fitzpatrick foundry.

A. Bolter is very busy.

H. Roos & Co. are putting up a building adjoining their foundry 32x46, three stories high. They will operate a machine shop.

Mr. Nicolson, formerly connected with the Aermotor Co., as superintendent is now with the Stockham Co. at Cragin. R. R. Bailey succeeds him as superintendent at the Aermotor Co. H. S. V.

How to Use Plumbago Crucibles.

*By JOHN A. WALKER,
Vice-President of The Jos Dixon Crucible Co.

I have in a previous article called attention to two good points in the use of crucibles, and in the way of a preface will here briefly recapitulate. The first is a proper annealing, about which the Dixon Company advises as follows:

Every Dixon crucible is annealed before leaving our works. All dry crucibles, however, are liable to absorb moisture in going from our shop to yours.

On arrival at your works they should be immediately unpacked and stored in a warm, dry place to keep from taking up further dampness.

Then to provide against possible accident it is wise to re-anneal.

Before being placed in a hot furnace the temperature of a crucible should in every instance, in the re-annealing, be slowly raised to at least 212 degrees Fahrenheit, or even a little above the temperature of boiling water. This will remove all moisture.

*The previous article Mr. Walker refers to was first published in THE FOUNDRY.

REMEMBER, IN HASTY WORK YOU TAKE THE RISK.

Any time a press of work compels you to use our crucibles immediately on arrival, and without the re-annealing up to 212 degrees Fahrenheit, if they scalp or flake off on the first heat the fault is not in the crucible. We cannot be held accountable for such accidents if our instructions are not observed.

An additional word is, if the crucible be a large one, after toasting its outside walls, set it over a black slow fire bottom side up, that the inside walls as well as the outside can feel the good of the toasting process.

The remaining point before noticed is that the melter shall keep in stock new crucibles —those not before in the fire at all, and also partly used ones—those that have gone sundry heats and have received the vitreous glaze which comes after several heats. Then for his new and slow fires put in the brand new crucibles, and heat them up gradually, but for the hottest fires always put a crucible in that is coated with the glaze.

The careful observance of these two hints will obviate most of the cracks and scalps which otherwise might take place on the first or second heat. A crucible having now got safely thus far, its future good behavior depends:

1st. On the fit of the tongs. In a fire hot enough to melt brass, or copper, the crucible becomes soft and pliable. In lifting it out to pour, if the tongs do not fit, or are not made to grip the crucible at the right place, it is easily squeezed out of shape and liable to crack. The Dixon Company suggests that the tongs be made to grip the crucible just below the bilge, so it will not need such a tight squeeze. Some melters use tongs shaped like the Ace of Spades; such tongs remove the coal much more easily than those of the regulation shape.

2d. On the kind of coal used for fuel. Coal with too much sulphur destroys, unnecessarily, the life of the melting-pot. I have seen a carload of crucibles give 25 per cent more heats by a change of coal.

3d. The melter must not expect as many heats in melting one metal as another. From three heats when melting nickel, to six in melting steel, to twenty-four in melting copper, the heats run up in the forties when melting composition.

4th. The drafts and dampers, if arranged to produce a reducing atmosphere, as against an oxidizing atmosphere, will lengthen the life of the melting pot. An oxidizing flame is always unfriendly to a plumbago crucible.

5th. The flax used also bears on the same result. The binding materials in the walls of the crucibles are impervious to some fluxes and easy victims to others.

6th. The time of heat is also to be allowed for. If with modern furnaces, high drafts, and taller stacks, the best is taken off in 1½ to 1¾ hours, don't expect your crucible to stand this large punishment as easy as the lighter strain of a 2½ to 4 hours' heat.

7th. If in ordering your crucibles you could give a hint to the maker as to what metal is to be melted, he could tell better what crucibles to send.

In the old days a crucible was a crucible; in these modern days we make by twenty different formulas, or mixtures as they are called. So tell your maker what you propose to melt, and you will get a crucible better adapted to the work and one that will last longer.

8th. After pouring your metal, don't roll the pot out of doors where it will get rained upon, or on a bed of wet sand, or where it will absorb moisture. If you do, you put it exactly where in its hot, soft condition it will become spoiled either teetotally or partially. Also in lifting large pots by the crane, don't release the grip and let them drop four or five feet on stone floor; rather hold the grip until within two or three inches from the ground, and then drop them if possible on a bed of old dry sand.

9th. Don't leave any metal to cool in the crucible, but pour until the melting pot is clean empty. In the parlance of the shop, don't leave the crucible so you will find a "button" in the bottom when it is cooled off.

In cooling, each button will have small threads or spikes of metal which will attach themselves to the soft crucible walls and get solidly stuck in them, and they tear the walls of the pot to get them out.

10th. In charging the crucible, don't wedge the scrap in too tightly; expansion and contraction go on in the heating and cooling, and a careful charging will provide for this.

Oil as a Fuel for Core Ovens.

By H. HANSEN.

Coremaking goes back further than any of us can remember, and that is as far as we need look for its antiquity, for a great deal of this antiquity is still with us, hanging on with the friendly hold of time-honored custom, and in no hurry to say its last good-bye.

The persons selected for coremakers have in the past (and some of you are not above suspicion in this respect to-day) mainly been chosen for their ability to withstand abuse. In the forenoon they are called down for making away with the molders' gaggers, and in the afternoon the blacksmith is liable to entertain them for purloining some rods intended for a nobler purpose, while at night time, when anything has happened to a molder's work, you know how ready he is to unload the blame upon this same much-despised, much-abused coremaker.

But coremaking is making progress, like almost everything else, because it must. It is compelled to by the demands made upon it for better work, and more of it. The successful foundryman to-day gives the core room its share of attention as well as the foundry. He not only wants a core that will hang together but also shake out easy. He is opposed to using more rods than is absolutely necessary, not only because it is unpleasant to hear some imported foreigner taking them out, it is also expensive, and has led many to alter their mode of coremaking so that it allows these to be made and used without containing a single rod of any description.

One thing calls for another, however, and the core sand mixture that allows cores to be made from it of almost any dimensions without rods or anything else to support it also calls for great care in baking it, while many core ovens are heated in such a manner that the cores will not even dry thoroughly, not to speak of baking evenly.

There is a vast difference between drying and baking a core, and with improved sand mixtures it becomes an absolute necessity that a core shall be baked. This may seem easy enough to accomplish, and would be if we only had to occupy a small part of an oven, but with this filled with cores, it becomes a

---

Paper read before the February Meeting of the Western Foundrymen's Association.

most difficult matter to secure an even temperature throughout that will permit of all cores being baked evenly. Any kind of fuel will dry a core, anybody can do that, but when it comes to baking the same there is a chance to do some good hard thinking.

What is needed to bake a core is a certain amount of heat. I say certain, because too little will dry them without baking, and too much will burn them, causing trouble again. Most kinds of fuel give off a strong flame, and then we find all kinds of cores in an oven when the doors are opened. The hottest part of the oven furnishes some burnt cores; the coolest part some thoroughly green ones. Next to these come the cores that are dried but not baked, and lastly a small lot between those that are dried and those that are burned, which are found to be just right. Sometimes a whole ovenfull is burned; again, they may be all green. But it is very seldom, with ordinary ovens and fuel, that we find the whole number just done brown. We find the element of uncertainty coupled right on to the core oven, and in most places, when the fire is started, no one knows what kind of cores are going to come forth.

What else can be expected from a fire made with fuel that is uncontrollable? On clear and cold days the draft is good, and the first thing you know the cores are burned. The next day it is warm and raining, and you wonder how it came about that things are not right. If you are burning the ordinary fuel, such as coal, coke and wood, and you think anything about what you are doing, you soon begin to consult the Rev. Hick's almanac to find out how to fire up.

A fireman will keep his steam at a certain pressure throughout the day. He will produce a certain amount of heat underneath his boiler. He can do so because he has got something to go by, the steam gauge. He does not guess at what he is doing, as the coremaker does. How would it do to put a heat-recording instrument on the core oven? Some of you may be inclined to take this as a joke for your jollification, but it is not intended as such, although you would make a jolly person out of the coremaker if you would carry it out.

If experience will demonstrate that a core oven will bake cores of a certain kind, made from certain materials, with a known amount of heat in a given length of time, why would it not be possible to so arrange things that this could be done time and time again? If 400 degrees of heat will bake a core in two hours, why not put some recording gauge on the oven that will allow this to be ascertained? As it is now, we have, may be, 300 degrees for five hours, and still the cores are not baked, only dried. Then again, we may have 500 degrees for one hour, and burn them. Could anything be more uncertain?

When you want to measure a length, you apply a rule. When you desire the weight of any body you furnish a scale. When your perspiration reaches an unbearable point, you consult a thermometer. But when you want to know the amount of heat in your core oven, what do you do? You wink your eye, and say: "Well, they ought to be done, anyhow." When you later on become aware of your mistake in pronouncing this opinion offhand, you finish up with a disgusted look, and the remark that they looked like it, at all events. If a certain amount of heat will bake a certain class of cores in a certain length of time on one occasion, the same can be accomplished at any other time, under like conditions. Is this not a logical conclusion? For the sake of obtaining better results and for the quick handling of core ovens, give us something to guide us through our uncertainty in this respect.

Bread baking is a great deal like core baking. Things want to be just right in both cases. Many of you have seen scorched bread, not because the housewife was talking to the neighbors, but because she had no other alternative but to guess at the condition of the oven. I once visited the Soldiers' Home, at Quincy, Ill., and was shown through the bakery, with loaves stacked up like cordwood, all looking exactly alike, just the color when bread looks appetizing. Prowling further around, I soon found the cause for this beautiful condition of affairs in a thermometer attached to the oven. The man in charge said: "We maintain a fixed heat for so long, and we can't miss it, if we wanted to." I asked myself, right there and then, why can we not do the same way with out core ovens? Make them so hot for so long and be done with it, and be done right, too. It is well enough to guess at a thing, if we can guess very close to exactness, but most of us make

poor hands at this when it is applied to such a business as running a core oven.

As said before, what is wanted to bake cores is heat, not flame. Fuels that make a great deal of this are most unsuitable, if the fire is placed right in the oven. Wood, giving off the most flame, is the poorest fuel. Soft coal is nearly as objectionable, and coke, to a certain extent, so. A coke fire will yield an intense heat for a short period, and although it does not give off a great deal of flame, yet any fuel that is fluctuating in its heat-giving qualities should be considered as undesirable for a core oven, without some way of regulating it.

When a core oven assumes any proportions to speak of, it becomes a serious matter to heat it uniformly enough to insure the baking of all cores placed therein, without burning any of them. Several small fires in one oven will produce better cores than one large fire will, but the trick lies in keeping these going. Right here, fuel oil offers one of its special inducements, in that not only can it be burned in one place, making a large fire, but it can as readily be scattered into a dozen smaller ones, thus from the start aiding in the diffusion of heat, a quality that but few other fuels have. With a fire that could instantly be increased or lowered in intensity, what a pleasure it would be to work around a core room.

The means for accomplishing this lies within the power of any progressive foundryman, and is found in crude oil, or, as it is generally designated, fuel oil, from the fact that it is used only in that capacity, being unsuitable for illuminating. With a fuel as easily regulated as the light of a lamp, as clean as gas, and not so high in price as to prevent its use on a commercial scale, what is to hinder it from becoming universally applied to core ovens?

I know in some foundries coremaking don't amount to much, and as long as you can get a core that will hold a handle, you say, "good enough." With shops where coremaking costs 30 per cent, or more, of the labor account, this item is looked upon from a different point of view. You have often felt how annoying it was to find some small cores out of stock when wind-time was at hand. How do you think you would feel with an oven full of burnt cores on your hands, the molders clamoring for cores, the general expenses of the shop keeping right on, and somebody waiting for the castings at the same time?

Scratching your head won't bring a lot of burnt cores back to life any more than it will stop a runout. And you will have reason to scratch, if you try to make cores on a paying basis and attempt to bake them with ordinary fuel. Maybe, you can get fairly good results when tending to the oven personally, but the first thing you know, something calls you away, and when you return, the individual whom you told to keep an eye on it is trying his best to keep out of your sight, for reasons that you soon come across.

In baking cores with ordinary fuel, a great deal of it is wasted. There must be a draft, or else the fire will not burn; and the amount of heat that passes through the smokestack amounts to something in a year. Coal, theoretically, contains about 14,300 heat units, and nearly 7,000 of these are lost in gases that escape through the stack (and from other causes). There are practically only about 8,000 heat units available in coal that can be utilized in the generation of heat. One pound of crude oil has, according to late experiments, 20,240 heat units. In comparing the calorific properties of crude oil, it must be borne in mind that with coal there is an enormous waste of matter, while, on the other hand, every unit of heat that the oil contains is utilized, as there is no soot, smoke or odor, and a clear fire is generated, similar to that of natural gas. This is especially desirable in the baking of cores, as with a properly constructed furnace, within three minutes after starting the oil fires, the draft can be closed entirely, and after the burners have burned for about one-half hour, the oven will contain enough heat to bake all the cores that it contains, so that one-half hour's work with oil will accomplish the result of from four to five hours of coal, coke or wood.

An oil fire, by the latest developed system, is absolutely smokeless and odorless, and can be regulated to any degree of heat desired. As no furnace door is provided, and as it is not required to feed the fire, as with coal, coke or wood, no cold air rushes in, which is a detriment to the cores as well as to the furnace. Cores will be more conveniently and quickly baked with oil than with any other fuel, and, besides, the fires require very little attention.

With common fuel we must use more than is actually consumed; with oil, we cease to use it the instant the cores are baked sufficiently, and don't have to wait either for a large fire to burn itself out before the cores can be removed. Where an oven is used continuously, the saving of time in starting and closing a fire will be appreciated about as much the economy in the fuel itself.

Neither will common fuel come right into the oven by simply turning a valve or two. You must have somebody to poke the cinders out, someone to wheel in coal or coke, take out ashes, cut up kindling wood, and even if you do live in a country where coal is cheap, it costs you a good deal more than you think for, by the time you get all out of it you can and get the rest wheeeled away.

Two systems are in use for the utilization of oil as a fuel, one of which is operated by compressed air, and the other by gravity and steam. In the latter system, the oil is stored in a tank outside the building, and an oil pump takes the oil from the tank and forces it into a stand-pipe, from where it is carried by gravity to the burners. In order to keep the stand-pipe full and maintain a uniform gravity pressure, an overflow returning to the storage tank is attached. The burners are connected with steam pipes, the flow of steam atomizing the oil, intermingling it with a supply of hot air kept up by pipes from the furnace. The whole passes from the burner in a highly combustible and vaporous form, causing perfect combustion.

The other system substitutes for the oil pump and stand-pipe an air compressor, by which the oil is forced from the storage tank to the burners, there meeting a supply of air from the compressor. Both air and oil, as also steam and oil, are regulated by suitable valves. Of the two systems, the one operated by steam will doubtless appeal most strongly to the foundrymen, for its simplicity and ease and certainty in operation.

With crude oil delivered in carload lots at Indianapolis for 1⅞ cents per gallon, in St. Louis for 2 3-10 cents, Cleveland 1 7-10, and in Chicago for 1⅞ cents, there is not much to say in regard to high prices. And when it is remembered that with the best systems from 70 to 100 gallons of oil equal one ton of the best coal, and the cost of handling same is considered, it is plain that it cannot be long before this elegant fuel will do its own talking.

There may come a better way of heating a core oven, but until we find it in the shape of electricity, or something else, crude oil is worth considering, for it will cure and remove permanently the scowls and uncomplimentary tributes now paid to the coremaker. The kind of fuel we require for core ovens is not one calling for six months' training on the part of the one who attempts to handle it. What we do need is a kind of fuel that twenty words of plain English will enable the uninitiated to take a firm hold of, without being bucked off. And such we have in crude oil, the ideal.

Questions and Answers.

G. W. R. asks for a good mixture of brass or composition that will be perfectly sound under a water pressure of 200 pounds to the square inch, castings to be turned inside and outside and to be from one-half to one inch thick. Castings are in shape of heavy tubes and must be threaded quickley in order to supply at a low price.

Replying to the above F. J. D. writes that a mixture composed of 89 per cent of copper, 2 1-2 per cent. of zinc and 8 1-2 per cent of tin ought to give good satisfaction as it is a regular gun metal or bronze formula.

The Berlin Iron Bridge Co., of East Berlin, Conn., have just completed a very successful year. The shipments have been the largest in the history of the company and is represented by over one and one-half million dollars worth of business. At the annual meeting of the stockholders, which was held at the office of the company on Thursday, January 30, the following directors were elected: Chas. M. Jarvis, Burr K. Field, Geo. H. Sage, H. H. Peck, of Waterbury; S. H. Wilcox, of Brooklyn, N. Y.; J. W. Burr and F. L. Wilcox. At the meeting of the directors the following officers were elected: President and chief engineer, Chas. M. Jarvis; vice-president, B. K. Field; secretary, Geo. H. Sage; treasurer, F. L. Wilcox; manager of highway bridge department, D. E. Bradley; assistant to the president, E. W. Stearns.

Notice.

Advertisements Entitled Situations Wanted, or Situations Vacant Will be Inserted in this column one insertion FREE All others 25 cents per line.

WANTED—A patternmaker as partner in a foundry in St. Louis, with light capital; young man preferred. Foundry Third and Pope ave., St. Louis, Mo.,

FOR SALE—Practically new No. 4 Whiting cupola, sold on account of enlarging plant. Address G, No. 3, care THE FOUNDRY.

WANTED—Position as foreman; 20 years' experience on light or heavy castings; best of references; salary no object. Addrss M., care of THE FOUNDRY.

WANTED—Position as foreman in small foundry by foundryman 38 years old; 20 years' experience. Address 340 Dix ave., Detroit, Mich.

WANTED—Situation as foundry superintendent or foreman; 18 years' experience, 7 as superintendent; well versed in modern foundry practice; can introduce accurate cost system, etc. Address H., No. 2, care THE FOUNDRY.

FOR SALE—Not being a practical foundryman, I desire to dispose of my foundry in this city. I will sell or rent it at a very low figure and contract to take a large quantity of castings at going prices. Good country, and two lines of railroad. Address D. A. Gardner, Plymouth, Wis.

FOR SALE—Cupola for sale cheap, Whiting make, diameter of shell 32 inches, 23 inches inside of lining, length over all 27 feet 3 inches, four tuyers 4 inches by 5.34 and with charging door 15 inches square. Griffin Wheel Company, Chicago, Ill.

WANTED—By a thorough accountant who has had a long experience in the foundry business, situation as bookkeeper and cost accountant; is familiar with the latest systems of foundry books and construction cost accounts; can furnish N. 1 credentials. Address M. H., No. 1, care THE FOUNDRY.

FOR SALE—No. 3 Root Blower, used only a few months; to be replaced by larger size. Address B., No. 4, care THE FOUNDRY.

WANTED—A practical and up to date Founder desires a position as Superintendent or Foreman, or both if necessary. Have a process for melting iron and many other devices for manipulating a Foundry upon the cheapest known principles. All correspondence strictly confidential. Address H., No. 5, care THE FOUNDRY.

FOR SALE—Second-hand machinery and appliances; one 27 inch and 1 18 inch cupola, latest design; core oven with carriage, 4x20. One portable core oven. Crane 1 1-2 ton capacity. One drop, power pump, large tank, brass furnace, tumbling barrel, a large supply of flasks, ladles, facings, tools, etc.; one 12 H. P. engine and boiler; one 12 foot bed engine lathe, with all attachments; one upright drill, 30 inch; one power pipe threader, bolt cutter and nut tapper combined; one power swinging emery wheel (new); one emery stand; large grindstone; screw punch; one portable forge, lot of blacksmith's tools and a good stock of plumber's goods and mill supplies; one 12 foot bed wood turning lathe, all iron; one jig saw, wood working tools, etc.; an extensive line of patterns for architectural, engine, jobbing work, iron fencing, roof cresting, etc. All in first-class condition and can be bought for one-fourth its cost. Albany is the county seat; it is a live, healthy, growing city, with railroads, colleges, schools, churches, etc. The county took more prizes at the World's Fair than any other county in the United States. Owners want to give entire attention to large real estate interests. Address Address Chas. Gilbert & Son, Albany, Mo.

The Wooley Foundry and Machine Works at Anderson have recently cast a monster plate for rolling glass on that when planed and finished weighed 14,000 pounds.

Humphreys & Sons Machine Shop & Foundry at Joliet, Ill., was destroyed by fire January 26. Loss, $22,000; insurance, $17,000.

The Wolfe City Foundry & Machine Shop, at Wolfe City, Texas, was destroyed by fire February 6th. Loss, $20,000; insurance, $4,900.

Books, Exchanges, Catalogues, &c.

C. H. Green & Co., of Syracuse, N. Y., whose snap flasks are known far and wide, are sending a neat little catalogue to the trade describing their extensive line, giving prices, etc.

The Buffalo Forge Co. are sending out a great many thousand circulars, prepared in the artistic style, for which all their literature is noted, and devoted to their blower specialties. One of them gives two illustrations of Seventeenth Century foundry methods.

The Scientific Machinist Co., of Cleveland, Ohio, send us a copy of their descriptive catalogue describing the subjects and courses of study followed by their institute for Home Study of Engineering and Electrical Apparatus. It is a very handsome work and will be of especial value to any one interested in those matters.

"The Progress of the World," the editorial department of the Review of Reviews, is especially live and vigorous in the February number. Its paragraphs are packed with information about Venezuela, British Guiana, South Africa, and Canadian politics, to say nothing of its comment on the American financial situation and other matters of immediate national importance. The department is illustrated with the usual number of timely portraits and maps.

Home Study is the title of a nicely illustrated monthly journal of twenty-four pages, published at Scranton, Pa., in the interest of the Correspondence School of Mechanics.

It contains most excellent articles of an elementary nature on the subjects of mechanical engineering, steam engineering, electrical engineering, architecture, plumbing, heating and ventilation, mining engineering, mechanical drawing, civil engineering, geometry and popular science, besides appropriate editorial departments, etc. $1.50 per year, single copies 15 cents.

Harper's Magazine for March will present a new instalment of Caspar W. Whitney's "On Snow-Shoes to the Barren Grounds," the record of a sporting pilgrimage into the frozen waste of northern Canada, in pursuit of musk-oxen and wood-bison. Professor Woodrow Wilson's biography of Washington will introduce the youthful hero of Great Meadows and Braddock's disastrous expedition, and show how he was trained to lead a new nation. Owen Wister, Julian Ralph, and Helen Huntington will contribute short stories; there will be chapters of William Black's "Briseis," Poultney Bigelow's "German Struggle for Liberty," and of the "Personal Recollections of Joan of Arc," and the most complex piece of modern machinery will be interestingly explained in a paper by Park Benjamin, called "The Nerves of a War-Ship."

In 1884 Eugene Field wrote a story which he called "The Werewolf." When it was finished he laid it aside and a year afterward entirely rewrote it. In 1886 he again took it up and revised it, and during the nine years between that time and his death in November last, he rewrote it eight times. His last revision pleased him and he decided to print it. But death came too suddenly, and the story was found, unpublished, among his effects. Mrs. Field, concluding to have the story appear, gave it to the editor of The Ladies' Home Journal, in which magazine all of Mr. Field's work, outside of his newspaper articles, was presented to the public. The story will be printed in the next issue of the Journal, strikingly illustrated by Mr. Howard Pyle.

Obituary.

J. S. White, the oldest iron worker in Pawtucket, R. I., died in that city recently. He was born in Massachusetts in 1818, removing to Pawtucket in 1842. He began the foundry business in 1860 as a partner in the plant founded originally by his father, of which he became afterwards the sole owner.

Judah W. Clark, secretary-treasurer and general manager of Andrew Terry & Co., Terryville, Conn., died on the 3d inst., from heart failure induced by rheumatism, with which he had been a sufferer for some time. He was a native of Shelburne, Mass., and had he lived until March he would have been 53 years of age. He had been connected with the malleable iron industry of Terryville for over thirty-five years and was regarded as one of the best informed malleable iron makers in the state. He possessed a remarkably retentive memory and was a close student in scientific as well

as literary matters. Mr. Clark was of a modest, unassuming nature, a man of sound judgment and sterling integrity, and was held in very high esteem in his community. He was a director of the Turner Heater Company, of Bristol, and a trustee of the Bristol Savings Bank, a Mason, and prominently identified with local matters.

Joseph A. Shakespeare, president of the iron foundry firm of Shakespeare, Smith & Co., New Orleans, La., died in his home in that city, on January 22, at the age of 59 years. Mr. Shakespeare was born in New Orleans, and early evinced a taste for mechanical work. After leaving school, he joined his father, who was engaged in the iron foundry business. In order to gain a more extensive knowledge of the trade, however, he apprenticed himself later to the Novelty Iron Works, in New York city, in whose shops he worked for two years. He then re-entered the employ of his father in the firm of Shakespeare, Wheeler & Co. Shortly after he was made a partner in the firm, and the style was changed to Geddes, Shakespeare, Smith & Co. Later on and subsequent to the death of Mr. Shakespeare, Sr., the firm was reorganized with Joseph A. Shakespeare as president, under the title of Shakespeare, Smith & Co. Mr. Shakespeare was a public spirited citizen, and took a large interest in municipal and local affairs, serving two terms as mayor of New Orleans. He was also a member of the board of health of that city, and was well known and highly respected in business, social and philanthropic circles.

Foundry Mention.

The Q. & C. Company, of Chicago, will build a foundry.

The Fair & Day foundry, of Knoxville, Tenn., will build an addition.

The Whitman-Barnes foundry, at Chicago, was destroyed by fire February 11.

Messrs. R. N. Johnson and J. F. Boynton will start a foundry in Hudson, Mich.

The Deshler Mill Mfg. Co., at Deshler, Neb., will add a foundry to the plant.

The Gilbert Manufacturing Co., at Middletown, Pa., has got started.

The Somerset stove foundry, at Somerset, Mass., burned February 12.

Mr. James Donohue, who formerly owned a foundry at Bloomington, Ill., died there February 7.

The American Foundry & Furnace Co. succeeds the Soper Foundry Co. at Bloomington, Ill.

John Crowley and Robert Pettigrew, of Cortland, have started a foundry at McLean, N. Y.

Work has been started on the buildings for N. S. Bouton's Car Wheel Foundry at Birmingham, Ala.

The Mackellar Foundry, Facing & Supply Co., of Quincy, Ill., has certified to the secretary of state that their name has been changed to the Quincy Foundry & Facing Co.

The Keystone Axle Company, of Baltimore, which intends to erect a plant at Beaver Falls for the manufacture of car axles, has awarded Messrs. Moffitt & Son the contract for the foundations, and the Penn Bridge Company, of Beaver Falls, the contract for building, which is now under way. The building is to be steel frame, covered with iron, 80x200 feet.

Matthew Addy & Co., of Cincinnati, have just established an office at 975 The Rookery, Chicago, under the management of A. C. Hawes, for the sale of pig iron, old rails and old wheels. Mr. Hawes has a long experience in the pig iron trade in this territory, and will no doubt be able to do a large business for Matthew Addy & Co.

The Providence Aluminum Co., at Providenc, R. I., is a new concern established for the manufacture of aluminum castings of all descriptions, and as Mr. J. H. Lee, who is also proprietor of the Providence Brass Foundry, is manager of the new concern, its success is only a matter of time. Mr. Lee has had considerable experience in working this new metal and as his reputation as a foundryman is A1, his work will need no one to vouch for it.

I am well pleased with THE FOUNDRY, and get much information from it.—Adam Stewart, Greensboro, N. C.

One article alone in your December issue was worth the price of a year's subscription. —Henry T. Merriam, Manufacturer of Structural Iron Work, Millbury, Mass.

Keeping Molders in the Shop after they have Poured Off.

E. B. Gilmour, of Milwaukee, writes THE FOUNDRY concerning the discussion at the January meeting of the Western Foundrymen's Association on the subject of keeping the molders in the shop until quitting time when their molds are poured off. Like most of those who have had anything to say on this subject, Mr. Gilmour thinks it will be more to the foundrymen's advantage to permit the molder to go home. He says: "It always causes discontent and helps to destroy that harmony so essential to the perfect running of a shop. The sooner the molder is permitted to get out of the hot, dusty, smoky, steaming foundry, after his work is poured off and permitted to go home and have a bath, the better for his health, strength and family, as well as the employer. When a molder puts up a good day's work according to the standard of these times, gets it finished in time without keeping the plant back, pours off and shakes out, it will be best for the employer to have that man out of the shop as quickly as possible in order that he may be in the finest possible condition to duplicate his work the next day. Molding or trying to mold in hot sand is out of the question. Patterns are apt to "sweat" and twist, bad draws will result and molds patched when hot are likely to scale.

The New England Foundrymen's Association.

The New England Foundrymen's Association held their first meeting at the United States Hotel, Boston, February 11, and transacted considerable business.

The General Electric Co., of Lynn, Mass., H. B. Murless, Rockville, Conn., and the Union Iron Works, of Lynn, Mass., were elected to membership.

A paper by John A. Penton, in the nature of a review of the work done by the various associations up to date, was read and discussed.

After much informal talk among those present concerning the best methods to be pursued to make the Association a success, an adjournment was had until March 11th at the same place.

Thos. Carlins' Sons, of Allegheny, have secured possession of the Roan Iron Company's plant at Chattanooga, Tenn., and will remove it to some other city, if steps are not taken by Chattanooga parties to keep it there. The mill is well equipped.

The Vulcan Iron Company, Limited, of New Castle, has increased the facilities of its foundry by the addition of a 15-ton steam crane, which, taken with the present equipments, makes the foundry one of the best for its size in the country. Other improvements consist of an electric plant to furnish light; a large positive pressure blower, of the Connersville Blower Company's make for the foundry, and a new smith shop.

The Falcon Bronze Company's new plant at Youngstown, O., has been fully started up and orders have been booked which will employ it for some time. The product will be brass and bronze castings, particularly such as are required by rolling mills and blast furnaces. At the annual meeting held last week the following officers were elected: President, G. B. Booth; secretary and treasurer, John Tod; general superintendent, G. A. Doeright.

The Ashland Foundry, at Ashland, Wis., made an assignment recently. Liabilities and resources each about $3,000.

I would like to congratulate you upon the success of your journal and the amount of information which you are imparting through it and hope you will receive such encouragement as will enable you to occupy a still higher standard in the future.—H. R. Ives, H. R. Ives & Co, Montreal.

Here is a Chance.

One of our friends who sends us in yearly a great many subscribers from the city in which he resides, suggests that it might be a good plan to offer something in the way of an award to that molder who sends us the greatest number in a given time. Acting on that suggestion, therefore, we desire to make the following proposition:

To the one sending in to this office prior to April 1st, 1896, the largest number of subscribers we will give a handsome molder's tool box with lock and key, together with a set of molder's tools, to the value of $25.00, list price.

To the one sending in the second largest club we will send tools to the value of $15.00, and to the one sending the third largest we will forward tools to the value of $5.00, and to the fourth largest list one volume of either West's or Bolland's works on iron founding.

The tools given are to be the well-known brand manufactured at Burr's Damascus Tool Works, Detroit, Mich., and the winners of the prizes to select such tools as they desire from their illustrated catalogue. The names of the prize winners to be published in our April issue. All parties competing must announce the fact when sending in clubs.

He Knew.

F. H. Koretke, brass founder in New Orleans, relates an experience in his place of business recently that illustrates the intelligence of the average brass molder.

He said that he had filled an order for some trolley wheels and had some of the finished wheels in his office. A brass molder came in and said he could tell by looking at it just what the mixture was.

Mr. K. said he felt sure that he could not do as he said and prove it by analysis, to which the molder replied: "Do you use that?" And upon being asked to explain himself, said: "Do you use analysis? I used to use it, but found it would not wear well and quit using it, and would advise you to do the same." After Mr. K. had got through laughing at his visitor's assumption of knowledge he asked him if he knew what he was talking about and got for a reply: "Well, I guess so. I have used fourteen different chemicals and found analysis the poorest of the lot."

The Philadelphia Foundrymen's Association.

The regular monthly meeting of the Foundrymen's Association was held at the Manufacturers' Club in Philadelphia, on Wednesday, February 5, the President, Francis Schumann, occupying the chair. The general order of business was departed from on this occasion, routine business being deferred to allow of ample time for the reading of papers and discussions.

The Anniston Pipe and Foundry Company, Anniston, Ala., represented by J. K. Dimmick, vice-president of the company, were candidates for election, and their application was promptly acted upon by a motion directing Secretary Evans to cast a vote electing the company to membership in the association.

A. E. Outerbridge, of William Sellers & Co., incorporated, Philadelphia, then read a paper on "Molding Sand and Its Preparation."

Molding Sand and its Preparation for Mold and Cores by Old and New Methods.

The essential qualities of good molding sand are "toughness and "porosity." Toughness is the quality which enables individual grains of damp sand to adhere together when pressed in the palm of the hand, and larger masses to retain the impress of a pattern when the sand in the mold is rammed by hand or by machine power.

Porosity is the quality which permits free escape from the mold of heated air, steam and gases formed at the moment of pouring a casting.

These two qualities are dissimilar, and may almost be described as antagonistic, since the presence of alumina in excess (clay or "loam") which imparts toughness, tends to close the pores of spaces between the sharp grains of sand, and thus to prevent the free escape of gases, while on the other hand, porous molding sand if deficient in alumna is weak.

The most highly prized molding sands are those in which toughness and porosity are united by nature uniformly and properly for the molder's purposes.

It is rare to find the clay "binder" and the grains of sand distributed uniformly so as to make a homogeneous material, or, to speak more explicitly, to find each individual grain

suitably provided with its little over-coat of alumina or clay.

One portion of sand bank, for example, may have too much loam, owing to various local causes (such as contiguity to grass roots or other vegetation; the depositing of too much clay by infiltration and settlement from muddy water, etc.), in which case the sand is technically described as "too fat." Another portion of the same bank may be composed too largely of "sharp sand," in which case it is "too lean."

A mold made from such heterogeneous sand is apt to be spongy in some parts and hard in others, conditions which are liable to cause various defects in the mold and casting, such as a "breakdown," due to lack of binding material in the sand, a "scab" or "blow" due, on the other hand, to the hard spots caused by excess of loam.

The molder does not always correctly reason out these causes of defects, but he knows by experience that all molding sand is improved by riddling, treading or re-working, and not a few very careful molders consider this work an important part, if not actually a secret of their trade. This "secret," of course, is in producing a more homogeneous molding material by these crude methods.

In view of the advance that has been made in scientific foundry practice in recent years, it is somewhat surprising that so little is known (or, at least, published) regarding the character and treatment of molding sand.

Mr. Walter Bagshaw, of Batley, England, read an interesting paper upon the subject a few years ago, before the Institution of Mechanical Engineers. More recently THE FOUNDRY had a very brief article, and the Molders' Text Books contain the usual empirical rules for preparing molding sand. Beyond these references, I do not know of any exposition of this not unimportant branch of the founder's art, either from a technical or an elementary standpoint, and I am under the impression that comparatively few founders have investigated the subject further than to become sufficiently expert to squeeze a ball of damp sand in the palm of the hand and thus judge of its strength. The so-called expert then usually trusts to luck, and if that fails, as it sometimes does, he probably startles the unfortunate sand man by an unexpected complaint; these amenities are perhaps regarded by the founder and the sand man as normal incidents of the business. Be this as it may, I am convinced that the average founder is blissfully ignorant of the composite character of his molding sand, and also of the financial importance of the question; furthermore, he would be surprised to find what a simple study the problem really is.

A microscope of moderate power, magnifying two or three hundred diameters, will greatly enlarge his knowledge, and a little washing pan, preferably having ledges, or pockets, similar to those used by "gold panners," will enable any foundryman, after a little practice, to determine in a few moments (approximately at least) the character and value to the molder of any sand.

By aid of a students' balance, a much more accurate analysis may be made without expert chemical knowledge.

The average "good molding sand" contains from 5 to 10 per cent of alumina or clay, this is the "binder;" the proportion of clay may

Sellers' Sand Sifter and Mixer.

be roughly ascertained by weighing a dried sample of sand, washing the clay out of it, again drying and re-weighing. Floating particles or organic matter may be collected and the weight deducted, but an accurate determination of the organic matter requires prolonged combustion in a platinum crucible, an operation which pre-supposes the employment of a chemist.

From 80 to 90 per cent of ordinary molding sand is silica (silicon-oxid), and simple washing, while giving a rotary motion to the pan, will serve to collect different sized particles of the silex or sand in the different pockets or ledges, a large preponderance of very fine particles of silica is almost as deleterious (if the sand is to be used in large molds) as an excess of alumina, impairing the porosity of the mold.

In addition to silica and alumina, molding sand often contains a little iron and some magnesia, but these elements are not important. The presence of iron is indicated by the color of the sand, and if a sample containing iron is heated red-hot, and then cooled in the air, it becomes quite red in color from oxidation of the finely divided iron.

By examining, in the simple way I have stated, several samples of sand from a boat or car load any marked differences in composition, size of grains, or uniformity of distribution of the binder may be readily detected.

It is more difficult to thoroughly mix different grades of sand, or other substances with sand, than it is to ascertain the composition. Synthesis is in this case more difficult than analysis.

The foreman who prepares a batch of "core sand," for example, by adding certain measures of flour, coal dust, or other materials to a given number of barrow loads of sand, knows that it is necessary to turn over the pile many times, and also to pass the materials through sieves to obtain even an approach to a homogeneous mixture. If the sand is too damp some of these substances adhere together and clog the sieve; if it is too dry some of the impalpable particles fly off into the air. It is thus apparent that the proper preparation of molding and core sand requires time, labor, and at least some degree of skill.

Different foundries have different rules for making "core sand," or facing sand," and for enriching the "heap sand," depending a good deal upon circumstances.

The German rule for facing sand is to add one part by measure of new sand to two parts of old sand, to which is added bituminous coal dust in proportion of 1-10 for large castings to 1-20 for small castings. In England four parts by weight of new sand and one part of coal dust are commonly added, to six parts of old sand for ordinary work.

In this country similar rules obtain, with variations, depending upon the kind of sand and character of work. Where the mold requires overhanging parts the sand must be strong, but in simply box shapes more "rotten" sand is better. The good judgment of the foreman is here exhibited.

Plumbago is chiefly confined to "printing," or surface dressing with a sleeking tool. Whatever special proportions are used in different foundries, the same necessity exists in all for thoroughly mixing the old and new materials, and, until comparatively recently, the old methods of riddling and shoveling were adhered to. In Germany a Mr. Schultze proposed a new method, which though imperfectly carried out by him, was decidedly revolutionary and a few years ago the firm of Wm. Sellers & Co., incorporated, of Philadelphia, began experimenting upon this new principle of preparing molding and core sand by the aid of "centrifugal force." The first machine was a comparatively crude affair, but when the correctness of the principle was demonstrated the apparatus was remodeled and greatly improved; this now thoroughly practical and simple machine (resembling a giant toad stool) attracted the attention of visitors at various times, and duplicates were made at the solicitation of the representatives of several of the largest establishments in Philadelphia.

These little machines then created for themselves a reputation, which was followed by a demand for more of them, and the appartus illustrated herewith is now regularly manufactured by the Sellers Company for sale.

The machine is remarkable both as a labor saver, and as an improver of molding sand. It accomplishes as much work by the help of two laborers working three hours a day in preparing facing sand as five men could do in

ten hours by the old method, and it is found that as the sand is much more uniformly mixed and tempered, its quality of toughness (without impairment of porosity) is decidedly improved. The expert can readily perceive the difference by making a ball of sand before and another after passing once through the machine.

The apparatus consists essentially of a rapidly revolving table having upon its upper surface a number of prongs grouped about a central axis. The sand is fed through a hopper and thrown with great force from prong to prong, emerging from beneath the cover in a fine shower, free from lumps and thoroughly mixed.

The hopper is hinged for convenience of cleaning the revolving plate and prongs, and for removing stones, nails, etc.

A vertical shaft carries the revolving plate, and a pulley for the driving belt. The apparatus is also furnished, when desired, with a small electric motor, and may be shifted to any part of the foundry that is convenient for its operation.

A box containing "strong Lumberton" molding sand in the form of hard lumps, ranging in size from an English walnut to an acorn was shown, together with another box containing a sample of the same batch of sand after being passed once through the machine. This was entirely free from lumps, and looked as uniform as though it had been carefully screened; the machine is not intended, however, to separate jaggers, nails or stones. Sand containing such foreign bodies should be passed through a coarse screen before going to the centrifugal mixer.

In addition to this exhibit specimens from the laboratory were shown (mounted under mica plates) of molding sand and its constituents, facing and core sand, and the speaker said that it was his intention at some future time to take up the subject still more in detail.

At the conclusion of the reading some discussion arose on points brought out by the paper. In answer to a question: "What did you notice when you used a powdered resin in the core mixture? Was there a tendency to a separation of the resin from the sand?" Mr. Outerbridge replied that there was no separation whatever. Before the sand could get out, he said, it was thrown backward and forward an inestimable number of times, and it was this action that caused the thorough mixing. The breaking up of the lumps before it left the machine.

In answer to another question, Mr. Outerbridge stated that the machine does not grade the sand as to fineness, but merely breaks it up and mixes it, making one uniform grade. Asked "What constitutes the difference between good molding sand and poorer sand?" Mr. Outerbridge said: "Throwing aside the occasional presence of lime—which acts as a flux and helps to form with the silica a vitreous glass, burning to the surface of the casting—I would say that ideal molding sand consists of moderately coarse grains of refractory silica, the grains being of comparatively uniform size to insure porosity of the mold and just enough alumina uniformly coating each grain to give the necessary adhesive quality to the material. I have seen specimens of heavy castings poured with hot iron with which the sand was so firmly incorporated by burning that the surface resembled that of an emery wheel, and the casting could not be machined until the burned-in sand was removed by prolonged pickling. The porosity of the sand depends upon the uniformity of the size of the grains. You may have a very poor sand in respect to its porosity, and yet a very weak molding material, owing to the paucity of alumina. If you have a sand of uniformly fairly large sharp grains, each grain covered with a little binder of alumina, you have an ideal molding sand.

Asked whether he could explain the difference between a new sand and a much used sand, and whether he knew of any method by which the burned sand could be put back in a condition as good as new, Mr. Outerbridge said: "I cannot say. It is a conundrum the answer to which would be keenly appreciated by many founders. I can only suggest that if you desire to experiment in this direction the little apparatus I have described will afford ideal facilities for that purpose.

Mr. Gill said he had made some experiments in the way of improving sand, and had found he could keep his sand in the shop, without being obliged to wheel it out to any extent for renewal, by adding fresh sand and using once in a while a little clay wash, which would give the coating required. He

thought this treatment could be well carried out by the use of apparatus similar to that described by Mr. Outerbridge. His experience had been obtained in the manufacture of car castings and car wheels, and in his opinion the most desirable sand for car wheel purposes was a coarse grade, used with a good facing, the facing very wet, and the coarse sand as dry as can be worked. This course had, he said, always given good results in his practice. He had found that the addition of alumina would restrengthen old sand, but a large proportion of new sand was necessary as well.

A paper by R. A. Hadfield, a member of the Hadfield's Steel Foundry Company, Sheffield, England, on

The Labor Question

was next read. It had been expected that Mr. Hadfield would be present in person, and arise afterward, but important business engagements prevented his attendance. Mr. Hadfield wrote:

I much regret being unable to attend your meeting, but as you expressed a wish for some contribution on the important matter under discussion, "The Labor Question," the following will give you some idea of my own personal views thereon:

I need hardly say that this subject opens out such a wide field that in a short communication like the present it is not possible to do more than briefly indicate ones own views that a conciliatory spirit and a fair-minded attempt to look at both sides of the question are the only ones likely to bring about a working basis between capital and labor.

From my own experience in metallurgical discussions I have often found two apparently very dissimilar expressions of opinion when thoroughly investigated and analyzed have much the same end in view, so it often is in the struggles between capital and labor. I strongly believe that the different points of view on this subject do not possess such divergency as to give rise to the internecine struggles that now disgrace modern times. In other words that if it were possible to get together employers and employes on a better and more friendly footing a large proportion of the friction now experienced might be avoided.

The foregoing represents briefly my own views of the situation, the grounds for which I will give further on when mentioning my own experience.

I was first actively brought in touch with labor matters about eight years ago in connection with a dispute at the works of our firm, "Hadfields Steel Foundry Company,

---

Mr. Robert Hadfield is yet many years on the sunny side of forty, but has succeeded in winning a reputation for himself as a metallurgist as well as an extensive manufacturer that is known in every civilized country on the earth's surface.

The manganese steel with which his name must be always largely associated, is the result of a large number of original experiments conducted by him on a most extensive scale in order to determine accurately the exact influence of silicon, manganese, etc., on iron and steel and their alloys.

The results of his work in this direction have been largely incorporated in several papers read by him before the British Iron

R. A. HADFIELD.

and Steel Institute and other scientific associations in his own country. In addition to his duties as head of and managing director of Hadfield's Steel Foundry Company at Sheffield, England, he has found time to not only attend to all the foregoing, but he is also a leader in several other literary and educational institutions, where his large fund of practical knowledge has made him a leader.

Mr. Hadfield has visited this as well as many of the leading European countries on both business and pleasure many times and has business interests of some magnitude in America as well.

Sheffield, England." It did not concern rates of wages, in fact it was one of those disputes that often give rise to the most severe struggle, that is the question of management. Our general manager wished to introduce a set of rules, a sort of Code Napoleon, for the internal government of the works. They were not specially arbitrary, but amongst them some of the conditions caused considerable irritation to the employes, and after several unsuccessful attempts to settle the disputed points it became necessary for me as president of the company to receive deputations, or a strike involving between 500 and 600 men would have occurred. After carefully investigating the whole matter I became fully convinced that we had been unreasonable, the objectionable features were therefore removed and the strike averted. As a matter of fact, this entire set of rules, to be enforced and which were then modified, have been since consigned to the limbo of the unforgotten. This has certainly resulted in no loss to the firm, while I think it has added much to the personal comfort and even the dignity of the employes. Apart from this for over twenty-five years we have never had the slightest trouble of any kind with our workmen, representing engineers, fitters, foundrymen, melters, laborers, etc. My experience at the time named convinced me that in nine cases out of ten, by each side coming together and being willing to discuss matters a little outside the lines of "meum and teum" most labor disputes could be prevented. Whether the tenth case could be avoided rests much upon the line of thought taken up in the directions indicated by the following remarks. But to prevent the "Tenth" it does appear to me absolutely necessary that employers and employed should meet from time to time, not when disputes are under consideration and friction exists on both sides but when a fair-minded and unprejudiced consideration can be given to the various questions concerning the improvement of the workers' position which the very essence in modern evolution and progress render necessary.

It is for this reason that I have been actively interested in the formation of an organization on the other side which has received the name "The Industrial Union." This Society aims at securing members from the ranks of both employers and employes, so that congresses can from time to time be held both locally and at some central seat. In other words it would be the parliament or congress where both sides of the "Capital and Labor" question could be heard and chiefly at times when no bad blood had been drawn or troubles actually in sight. If your association is at all interested in the scheme I will willingly forward prospectus giving details of our programme and objects. Speaking from my own experience I can say that it has already brought me very pleasantly in touch with men representing the labor side and of whom until that time I had profound distrust, but upon a closer examination their aims were not found to be of that unreasonable character for which they usually receive credit. Nor are these aims revolutionary or likely to disturb the just reward of capital if those representing the latter are willing to be fair-minded and not believe that the essential in life is to be devoted to the extraction of the full pound of flesh. In other words that capital has its obligations instead of its rights.

Naturally enough this Industrial Union meets with objections of all kinds, and fair criticism is the best of all tonics to any new movement, but on the whole the reception to its ideas has been a favorable one and there are good hopes that in course of time it will find a useful purpose in helping to deal with this complex problem.

The council of this union equally divided between capital and labor includes influential men like Sir David Dale, Mr. W. Whitwell, M. P., on the one side, and on the other moderate labor leaders like Messrs. Trow, C. Hobson and Johnstone.

The aims of the society are to gradually "festina lente;" we don't expect to do more than touch the surface of the problem of "how to bring about a better feeling—the entente cordiale—between the two international camps of modern times."

In submitting the foregoing the writer does not wish it to be thought that the problem to be solved here is of exactly of the same character as that on the other side. For example, as regards the amount of wages there is no doubt that a worker here is better off than in England and much better off as compared with those on the Continent. Whether the

wages earned will go as far as in England is another and more debatable point, which it is not necessary to enter into here, but I do think that whilst wages are higher here, there is too much driving and that too much is often expected from the worker. No doubt it is the necessary outcome of the extremely high pressure on this side. Then again the question of "piece work" is probably overdone. In the hands of fair-minded employers piece work may be indirectly good for both employer or employe, but there are often to be met, whether in England or America, employers who seem to glory in exercising "the squeezing of rates" to such an extent as to give the greatest extremest among labor men arguments with which to justify their position.

My own experience is that the apportioning of piece work requires most delicate handling. If a shop is properly equipped organized and well managed by its foremen I question very much whether piece work possesses that advantage commonly believed. So long as we are all on the same footing I am in some ways glad that the labor unions have in my district in England taken this matter out of the hands of the employers as regards a considerable portion of foundry and machine shop piece work. All unionist workers in the district, which represents 95 per cent of the skilled labor—the un-skilled and non-unionist labor is nearly always dear at any price—are therefore on the same footing. Nor do I think this has affected us seriously in our competition for work nor that of other firms in the same district. It should always be remembered that this is qualified by the conditions before referred to, namely, that the shop should be run by competent foremen, able to organize, lay out, and arrange the work to the firm's best advantage. I have never found labor unions to throw obstacles in the way of cheapening production so long as the attempt was made on fair and reasonable lines, and they certainly encourage the production of the best work of its kind as well as the evolution of the best class of employe. In my own works I do not think that the cessation of piece work in much of our work where "journeymen," that is, full blown engineers or moulders, are employed, paying insurance, the shorter hours to which I will refer later, and other points, that our costs have been increased so as to put us outside competing for our usual class of work.

From the foregoing it will be seen that I do not consider unions are the bugbear some do. Of course, there is often stupidity and ignorance, perhaps met with more in England than here, but this is only the more reason, so it seems to me, for at any rate attempting to remove by friendly intercourse that want of knowledge on their part both regarding economical and financial conditions, technical knowledge and general progress. Therefore, all the more reason that employers and employed get in friendly touch. Our own experience has been that the latter are not so impervious to efforts in this direction as is so commonly supposed.

At any rate from the most selfish of motives, though the strongest with us all, it is worth while making an attempt to remove the prejudice and misunderstanding now existing and which can only be done by coming in personal contact. The conditions of modern business, that is the working conditions, tend to drive wider apart employer and employes. Each of us have more to do, and this applies equally to the workers and the conditions generally are more complex. Hence we go blindly on, in the main through no bad intention on either side, until the unusual trouble occurs, when all the bad side of human nature, much alike whether in an employer or an employe, comes to the surface. Who in a large industrial establishment is personally acquainted with half a dozen of his employes? We employers are too apt to treat them as mere machines, with the usual result that there is a break down principally arising through want of lubrication. Hence, it seems to me the necessity of organizations such as I have before referred to—in other words, some body composed of representatives from each side—when opportunity should be given of meeting together for friendly discussion and the like. Trades Unions, as we call them, whilst having their weak side, are in my opinion, in many ways beneficial to the community, and not least to those employers who endeavor to treat the labor question from a broad and friendly standpoint, and surely such a standpoint must in the long run, even when regarded from the lowest, prove the most economical, when one considers the enormous loss in

time, money and energy wasted in strikes. Speaking of labor unions in England, those of the standing such as the Amalgamated Society of Engineers, Moulders' Association and many others, of which I presume there are duplications on this side, an immense amount of good is done by them in fostering that independence of character so much appreciated by all classes here, self-respect, also providing, quite apart from strike pay, for out-of-work members, sick relief, funeral or death benefits, accident funds and many other aids or help to the employes themselves, which by the bigoted capitalists are entirely ignored.

Speaking of my own particular experience as to forward movements, the following may be of interest, and should the discussion, which I much regret being unable to be present at in person, lead to any further inquiries, I will willingly answer any questions or send details.

We have now in our establishment about 500 to 600 employes and have been successfully working for about two years on the 48 hours week. Originally our week's work consisted of 54 hours' time, that is each day's work was supposed to commence at 6 a. m. From 8:30 to 9 a. m. there was then an interval of a half hour for breakfast, an hour for dinner between 1 and 2 p. m., work ceasing at 5 p. m., and after that hour time and a quarter wages were paid, that is 25 per cent advance on the usual day rates.

As a matter of fact, and especially in winter, many of the employes were not at their post by the opening hour, 6 a. m., the foreman came in irregularly, no matter how strict the supervision that was attempted. The amount of attention paid to the preparation of breakfast whilst on duty no doubt cost the firm the unknown or x quantity! Four years ago, therefore, the experiment was made of reducing the time to fifty-one hours per week, and as this did well, we then gave forty-eight hours' time, as well as putting all labor of whatever kind, that is skilled or unskilled on exactly the same footing as regards the payment of over-time, the extra rates having previously applied only to the employes connected with labor unions. By the way, rather an indirect proof that employers usually only give what they are compelled to do, and thus strongly supporting, though probably they do not think so, the very objects of the fighting party on the labor side. I may incidentally say that this action of ours, that is of putting the unskilled employes, over whose protection the aegis of a union did not extend, upon exactly the same footing as the unionists gave great satisfaction, and while one does not expect any actual gratitude, yet I do think that our employes have in many ways made up to us whatever we might have lost by this change.

The employes now come to work at 7:40, after having had their breakfast, work until 12 m., one hour is taken for dinner, ordinary work ceases at 5 p. m., and on Saturday at 12 m. There is thus a half holiday on Saturday afternoon, but as you are probably aware, this is the usual practice throughout my country.

Another concession which has been much appreciated has been in connection with our insurance fund. Until about a year ago our employes paid about one-third of the total amount for their accident insurance fund, but we now give a free insurance. This covers any liability against fatal accidents, which means that the relatives of the deceased get $500, or in case of accidents one-third to one-half of the current weekly wages until health is restored.

Speaking generally as regards the reduction in the number of hours, a question which is fully discussed in the little work, written by Mr. H. De Gibbons, one of our social economists and myself, entitled "A Shorter Working Day," whilst my firm cannot, of course, draw strict comparisons or make absolutely definite conclusions, we feel confident that the change has been made at but little loss to the firm. Punctuality of the hour of starting, that is the commencement of hard work throughout the works at one particular hour, is in itself a saving. No late comers are allowed, and not only the foreman, but the managers themselves are in their places, which means many incidental savings.

Whilst I am aware that "one swallow does not prove a summer," I think that similar action in this direction taken by other firms in my country all go to prove that a consideration of other facts not hitherto considered as being business ones can be safely introduced in the working in modern industrial establishments. At any rate these questions are in the air and have probably come to stay. Thus the experience of any one firm who have made the experiment may be of service and lead to the more general consideration of this question.

I should like to conclude by saying that my own firm can only sustain its position in the particular branch of industry in which it is engaged by being able to meet the most intense conditions of modern competition, both as regards quality and price.

In the notice of the meeting to which you kindly sent me an invitation, I see that you lay special stress upon molders refusing absolutely to make piece work. Of course each firm must stand on its own footing as regards the class of work it undertakes, and of course I could not venture to give a definite opinion upon the particular cases you have under consideration without knowing more fully the conditions surrounding the individual cases in question. Speaking generally I am of the opinion that piece work does not in many cases possess the advantages commonly ascribed to it, and that with a modern equipped shop, thoroughly organized and well managed much more work can be obtained by ordinary day work than is commonly supposed.

At the conclusion of the paper a discussion ensued, in which Messrs. Outerbridge, Schumann, Glover, Messick, Justice Cox, Jr., Stanley G. Flagg, Jr., and J. K. Dimmick took part.

After passing a vote of thanks to Mr. Outerbridge and Mr. Hadfield for the excellent papers read before the meeting adjournment was made until March 4, when it is expected that details in regard to the convention of foundrymen to be held in May next will be presented and a programme of proceedings adopted.

CAST IRON NOTES.

Devoted to Inquiries from Practica Foundrymen on the subject of Melting and using Cast Iron. Address all Inquiries to W. J. KEEP, care of The Foundry.

The Use of the Shrinkage Test to Regulate a Foundry Mixture.

Last week a gentleman called on me who had within a few days met two founders who are using, or were endeavoring to use, the shrinkage measure of a test bar to control their iron mixture. The first one told him that it was a perfect success, that he could produce exactly the grade of iron that he needed, and that he had been doing so for over a year, and that he had no further need of chemical analysis for the reason that if his shrinkage was right, he knew that the iron contained exactly the right amount of silicon. When he called upon the other foundryman, he found a quantity of test bars lying on a table, also a wedge for measuring shrinkage. When asked if he used the shrinkage to control the character of his castings, he replied that he wanted to, but could not succeed at all.

Each founder used the same size of test bar and cast each bar in a yoke. The first one each day followed exactly the same routine in molding his test bars, in the tempering of sand and in grinding the fins from the bars. The same method followed each step, with the result that any change in the silicon in a casting was at once made known by a change in the shrinkage of the test bar. Everything was uniform except the silicon and shrinkage, and by a slight change in the amount of soft pig iron used, the shrinkage was kept at the desirable mark.

The other founder had not learned the value of precision. His test bars were not as uniform in size as they should have been, and he could not see the importance of following the same routine at all times.

The first question asked him was, Do you mark each test bar with the mark on the yoke in which it is cast, and do you place each bar in its own chill when you measure its shrinkage?

He could not see the use of all that trouble, as that ought to make but little difference.

Then he said he found wide variations in shrinkage, and he could not see any reason for it.

Many foundrymen are exactly like this one, careless and not able to make an application of what they see.

A chemist has learned to be accurate. His work would be worthless if he was not. Physical tests are worthless unless they are made as accurately.

Chemical determinations are made by methods which are used by all other chemists. Physical tests must be made according to a routine which has been proven to be the best.

In cast iron the physical test of shrinkage will give more practical information to the founder than any other.

If shrinkage increases, an increase of silicon (soft iron) will decrease it.

If the shrinkage is kept uniform the castings are always of uniform composition.

This is all there is to it.

A Founder wishes to produce Chilled Castings from Non-Chilling Iron.

The first iron drawn from a cupola, especially if poured from one fresh ladle to another, will often take some chill.

By placing steel clippings in the ladle and catching the melted iron on this, the silicon and carbon may be reduced so as to cause the iron to take some chill. The steel scrap is, however, likely to make the iron so sluggish that the chilled castings cannot be poured.

As there are quite a number of these castings to be made, and as they are quite small, it will be better at the last of the heat to put in a small charge of broken car wheel scrap, and in this way get a regular chilling iron.

A small chill piece can be made and cooled and broken to show when this charge begins to melt.

The Advantages and Reason for Slagging a Cupola.

The ash in the fuel and the sand from the iron charged unite and form a fluid slag.

A small amount of melted slag is beneficial as it strains out impurities that adhere to the drops of melted iron as they drop into the hearth of the cupola. With a cupola 54 inches in diameter, from 12 to 18 tons of iron can be melted without the slag causing inconvenience. With large heats it is customary to draw off the slag at intervals after about 10 tons have been melted.

This allows the cupola to run for any length of time. The only advantage is to allow a large amount of iron to be melted in one cupola. If the correspondent had asked for the disadvantages, the answer would be: Melting more than about 18 tons in such a cupola is a disadvantage every way.

The wind must be put on early to get the last iron down before quitting time, and a molder cannot mold after he begins to pour, therefore a long continued melt gives the molder a less number of hours in which he can mold. This decreases the output of the foundry and the molder's earnings. The tapping of slag makes an extra man necessary, and it fills the foundry with heat and steam.

The limestone that must be added to make the slag fluid materially increases the amount of slag, and absorbs a large amount of heat in melting, and this heat is carried out of the cupola through the slag hole.

A long continued heat and the lime burns out the cupola lining.

Enough cupolas should be employed to run off a heat as fast as the men can take care of the iron, and the iron should be melted so fast that the tap hole need not be closed during the whole heat. How to make a cupola melt so fast is not so easy to answer. The ordinary melter uses more fuel than is necessary, and the fuel must all be burned before the iron can come down to the melting point. In nine cases out of ten, if the fuel charges are made less, the iron will melt faster and will be as hot.

New Foundry Enterprises.

G. H. Holiday, of Ironton, O., is talking of starting a stove foundry in Knoxville, Tenn.

The Enterprise Foundry Co., at Muskegon, Mich., have their new foundry running.

A foundry company with a capital of $40,000 will be established at Lorain, Ohio. It will do the work for the Johnson Co., of that place, principally, although not owned by them.

The Standard Malleable Co. is the title of the large new plant that expects to commence operations in Muskegon, Mich., March 1st. Geo. H. Kingsley, the president, is a capitalist, whose residence is Cleveland. E. L. Howe, vice-president and general manager, has been for the past ten years superintendent of the Eberhard Mfg. Co., of Cleveland. Previous to this, however, he was with the Chicago Malleable Iron Co. and the Evart Mfg. Co., of Indianapolis. P. J. Martin, the treasurer, has for ten years had almost the entire charge of the Eberhard Mfg. Co.'s plant in Cleveland, and was before that with the Naugatuck Malleable Iron Co., Naugatuck, Conn., and the Cleveland Malleable Iron Co. J. Preston Rice was for eight years with the Eberhard Co. as salesman and will have charge of the sales department. Martin A. Senseny, the secretary, had charge of the collections and credit department for the Cleveland firm. The new concern ought to win if experience on the part of its officers are the essentials.

James Chalmers.

The History of a Tramp Molder.

W. EDWARD.

CHAPTER XXV.

We got into Mobile some time after midnight without my having been discovered by any of the crew, but as I was a stranger in the town I concluded to stay where I was until daylight, because the police in these southern towns are not over friendly with hobos and are liable to run a man in on the slightest provocation. As soon as it was fairly daylight, however, I pushed open the door of the car and looked out to see if any one was in sight, but the yards were deserted and I jumped out of the car and made my way down to the docks. I wandered around the docks for several hours talking to the sailors and 'longshoremen and inspecting the steamers and sailing vessels, to which I was a stranger, before I thought of getting breakfast. The docks and the shipping, most of which is engaged in the fruit and oyster trade, was a source of interest to me and I spent the greater part of three days lounging on the docks and clambering over the vessels, talking to the sailors.

There were only three small foundries in Mobile and they were doing practically nothing. The first day I found that there was no show for a job, but I lingered around for three days because I hadn't made up my mind where to go next and besides I was in no particular hurry. Mobile presents the appearance of a "has been," and it may in the future be a great city, as it is the natural outlet to the sea of the iron district of the central south, and it would not require a great expenditure of capital to dredge out the shallow bayou which leads up to the city, thus making it a port of entry for the largest ocean steamers. Enterprise and capital seem to be lacking, however, and while Mobile is really a beautiful city, the dilapidated mansions, ruinous stores, and the evident lack of thrift and enterprise on the part of the people give it an air of decay.

On the third day I concluded that there was no use of my hanging around there any longer as there was no possible show for a job either in the foundry or at any other kind of work. The country around Mobile is a regular garden spot and most of the small fruits and early spring vegetables which supply the markets of St. Louis and Chicago are shipped from Mobile. The principle traffic of the Mobile & Ohio road is in this line and at this time they were running two or three through fruit and vegetable trains every day, so instead of going to Texas, as I had intended, I thought I would strike for Memphis, as business would begin to pick up there by the first of May, and it was then the first of April.

It was not so easy getting out as I had supposed, as all cars going north were loaded with fruit or vegetables and the doors were locked and sealed. After seeing two trains pull out without any chance for me to stow myself away, I saw a car standing on a siding loaded with cabbage. The side doors were locked, but I found on examination that I could slide back the end door very readily. I didn't care about being cooped up any longer than I could help so I closed the door again and went off to prepare for my trip. As a preliminary I ate a good supper, then I had a lunch put up, filled my bottle and went over to the yards to keep an eye on that car until preparations were made to make up a train. I hung around until after midnight, but the yards were deserted and there was no sign of life, and just as I had made up my mind there would be no trains out before morning an engine pulled out into the yard and began to make up a train. As soon as I saw this I went over and climbed into the car I had selected and settled myself very comfortably on the top of the cabbages, after having closed the door.

I don't know what time we left Mobile as I was very sleepy and soon fell sound asleep. It was nearly 10 o'clock when I woke and the train was just pulling into Meridan, Miss. I had some notion of getting out here and running over to Jackson in search of a job, but I knew it was only a small town, and as I was comfortably fixed on a through train I decided to stay where I was until I got to Okolona, where the K. C., M. & B. crosses the Mobile & Ohio. When we reached Okolona, however, the car I was in stopped opposite the depot and there was quite a crowd of people on the platform, including the town marshall. As I could not get out of the car with-

out being seen, I laid low, knowing that I could get off either at Corinth or Jackson, Tenn., each of which is about an equal distance from Memphis. About 8 o'clock in the evening the train stopped at a water tank and I got out to stretch my legs, being tired from long confinement. None of the crew saw me get off and seeing the conductor standing alongside the engine I walked up and asked him how far it was to Corinth. He said it was about five miles. Then in a very meek way I asked if he would let me ride that far on the train. "No!" said he, very gruffly; "I don't carry tramps." Then I laughed and told him I had come all the way from mobile on that train and if I hadn't felt like walking he would have carried me on to Corinth.

Being so near Corinth I concluded to remain where I was until morning and then walk up to the town; so when the train pulled out I lit a fire near the railroad and sat down to eat a lunch and have a smoke, not having enjoyed that luxury since the night before. I had just got comfortably settled when I heard some one walking up the track and when he got opposite me I hailed him and asked where he was going. He came over to the fire, but to my questions he only shook his head and muttered something I could not understand. A trowel and a lifter, which I carried in my pocket I had taken out and laid beside me, attracted his attention, and by signs he made me understand that he, too, was a molder and as further proof he opened a bag which he carried on a stout stick over his shoulder and showed me a kit of tools. Taking a railroad map out of the bag he pointed to Mobile and traced the railroad up to where we sat and pointed to his feet, indicating that he had walked all the way. I gathered from his signs that he was a Swede and that he had shipped to Mobile from Sweeden on a sailing vessel, where he had left the ship and started out in search of a job at his trade. He had been on the road over two weeks and the poor fellow's feet were terribly sore and swollen. I gave him a big drink out of my bottle, which seemed to do him good, then I gave him what lunch I had left and John and I were soon on very friendly terms.

We slept in the open air around the campfire and the next morning walked up to Corinth. I had no idea that there was a foundry of any kind there, but I knew it was the crossing of the M. & C. and my intention was to catch a freight for Memphis and show the big Swede how to get over the country without wearing blisters on his feet, so the sight of a big foundry, machine shop and boiler shop rather surprised me as we walked up the track. I was still more surprised to find about a dozen molders working in the foundry, and I hadn't more than got inside before the boys began to yell at me and I found there was three or four of the fellows that I knew. There was Charley Carey and Albert Wheaton, from Memphis; "Ned" Thornton, whom I had worked with out in Fort Smith; Joe Lloyd and "Farmer" Jones, whom I had met several times on the road, and, while I was talking to them and explaining how I had picked up the big Swede. in come Morris Abbey, who was foreman of the shop. I felt quite at home with all the boys and I was pretty sure if there was anything to do Morris would give me a show, but I thought I would make it all right for the big Swede first, as he was broke, while I still had plenty of money in my clothes, so I tackled Morris to see if he would give the Swede a show. "What's the matter with you," said he, "don't you want to work?" "To be sure," said I, "if you have work for both of us, but I wanted to fix the big fellow first, as I can go up to Memphis and strike a job." "All right," said Morris, "I want a couple of men and you can both go to work in the morning."

The next morning Morris put me on the small cylinder floor and I made one or two cylinders nearly every day for the next two months. The Swede was a little green at first but he soon caught on and showed that he could do as much work as the rest of us, but I guess the poor devil got lonesome, having no one to talk to and not being able to understand a word of English, at any rate when we had been there about a month he went up to Memphis on a Sunday excursion, where he run across some of his countrymen working at the stove shop, who pursuaded him to quit in Corinth and go up to Memphis, where they would get him a job. So the next morning John quit, bundled up his clothes and his tools and went off to Memphis. About a week later poor John came back to Corinth with his feet covered with blisters

and without a cent in his pocket, having failed to get a job and being compelled to walk all the way from Memphis. His countrymen had helped him to blow in all his money and then turned him adrift and, not knowing where else to go, he came back to Corinth to see if he could get his job back. Morris took pity on him and put him to work and when I left he was still there.

Corinth was the scene of one of the hardest fought battles of the civil war and the ground where the shop stood was literally sown with minnie balls. One day I was making a pierce with a deep lug on it that I had to bed in the floor, and as my floor had never been dug up I got a pick and dug quite a hole in the clay floor. In throwing out the clay I came across a piece of a shell and two minnie balls, and I became quite excited over my find. Morris happened to come past the floor and I showed him the balls and the shell, supposing that he would be equally interested with myself. He looked at them in my hand and said that if I didn't want to keep them I could throw them into a bin over in the corner. I didn't know what he meant, but I went over to the corner to see what was in the bin, and I was more than surprised to see that it contained at least half a ton of balls of all kinds, and one of the boys, seeing me looking in the bin told me that they had been using the bullets for years for mixing brass. The house where I boarded was just across from the shop and about three hundred yards from the M. & C. depot. The house was new but on its site had stood a small frame house during the war and my landlady told me that after the battle the dead bodies were so thick that one might have walked from this house to the depot without putting a foot on the ground simply by stepping from one dead body to another.

Corinth was strictly prohibition and so far as I knew, there wasn't a "blind tiger" in the town. The prohibitory laws of Mississippi are so severe that a man could be fined if convicted of giving another a drink of liquor on the street, yet, in spite of this fact, I never drank more whisky in the same length of time or saw more drunkenness than during the two months I was in Corinth. The full force of men were never all in the shop at once except for one or two days a week, and several times it happened that there was not enough of us to get off a heat, although there were fourteen molders working there. The crowd would be off on a spree or laid up at home with a big head, the effects of an overdose the night before. All of the boys kept a jug in their rooms and as there was nothing to do at night and no amusements of any kind we passed the time in playing poker and sampling the various kinds of liquor, so that none of us were ever in very good condition for work, but I attended strictly to business and didn't lose a day during my two months' stay, which was something none of the rest could say.

There was a nice class of work in the shop and Morris and I got along well together, but I very soon grew tired of the town. I couldn't see any fun in getting a "jag" on every night, as some of them did, and unless you did this there wasn't a blessed thing a man could do to kill the time but to read, and I almost read myself blind. You couldn't even get a girl to look at you, as the molders were considered a very tough lot there and the girls gave them the "marble heart." I told Morris that I was going to leave and he tried to persuade me to stay. Said I was the only man in the shop he could depend on, and even offered to sign a contract to give me steady work for a year if I would only stay, but I just laughed and said I could get all the work I wanted to do without signing any contracts. What I wanted was less work and a little more pleasure, so I quit and went up to Memphis.

There was a little thing which happened while I was in Corinth which shows the peculiar ideas some foremen have of economy. I have seen the same economy practiced in other shops, but I just want to relate this as an example of a very bad system. One day Morris came to me with a small bevel spur gear and said that he wanted one off of it that day, sure, as it was part of the running gear of a large woolen mill, and the place had to close down until this broken gear was replaced. I sized the casting up and saw that every tooth had been stripped off the hub, and there was hardly enough left of any of them to indicate the pitch, yet he expected me to make a good casting from that piece of scrap, with only two loose teeth to help me. I advised him to go to the pattern shop and have a sweep made with two or three teeth

set on to the right pitch when the job would be comparatively easy. He didn't want to do this, giving as his reason that everything he had done in the machine shop or pattern shop was charged up against him and he wanted to run the foundry as cheaply as possible in order to make a good record, and told me to go ahead on the job and take as much time as I wanted. I went to work and rammed up the wheel, set my cope to one side and drew the pattern, then I centered the mold with a pair of dividers and drove a quarter-inch rod down into the bottom board to work by. I had nothing to guide me in spacing the teeth, or in getting the correct pitch except a pair of dividers; there were twenty-five teeth in the wheel and in spacing if I varied even a sixty-fourth by the time I got around I would be out three-eighths of an inch. This is pretty close work in sand and I wasn't stuck on the job, but I did the best I could under the circumstances. By the time I got the teeth built up the first time I found that I had gained about an eighth of an inch at the bottom of the bevel and had lost about the same on the top, so I went to work and cut the teeth all out and commenced all over again. I spent the whole day on it and built up those teeth half a dozen times, but each time I gained a little or lost a little in the spacing and when quitting time came I shook the whole thing out. Morris then concluded to take my advice and have a sweep made with three teeth set on it. I went to work on it again and this time with the help of the sweep I made the job in an hour. But my trouble was not over, for when I stood up to inspect it the mold didn't look just right to me, and after measuring it and counting the teeth I found that there was half an inch less of a pitch on the mold and two less teeth than there was on the old casting, so I shook it out again and went up and roasted the patternmaker for his mistake. I finally made it, but it was not until the third day and then when I got the rigging I wanted it took me less than an hour to make the job. If my advice had been taken in the first place the job would have cost about one hour for the pattern shop and an hour for the foundry. In trying to save the expense in the pattern shop the foreman was willing to give me a whole day on the job and before it was made he had twenty hours of my time charged up against him in the foundry and two hours in the pattern shop, to turn out a casting weighing less than fifty pounds. Of course this was a break-down job and if the teeth had not been stripped so badly it might have been made with no other rigging than a couple of loose teeth, but there are plenty of shops in which I have worked where the same system of economy (?) is practiced, and standard jobs are made in this slipshod way without a proper flask or rigging for doing the work, and then the proprietor wonders why it is that the foundry is so unprofitable; concludes that the molders are not doing enough work and he will have to reduce the wages.

I recall another instance in this same shop where a stock casting cost twice as much as it should every time it was made. There were two water columns went with every boiler turned out and instead of having split patterns two old castings had been cleaned up and wooden pins driven in the ends and the openings on the sides to serve for core prints. In bedding them in it took about as long to make the parting as should have been given to the whole job, besides they often stuck down and required considerable patching. The cores didn't fit properly and about three out of every five were lost by the iron getting into the vents and causing them to blow. With split patterns and close fitting core prints and all trouble and a considerable expense could have been avoided.

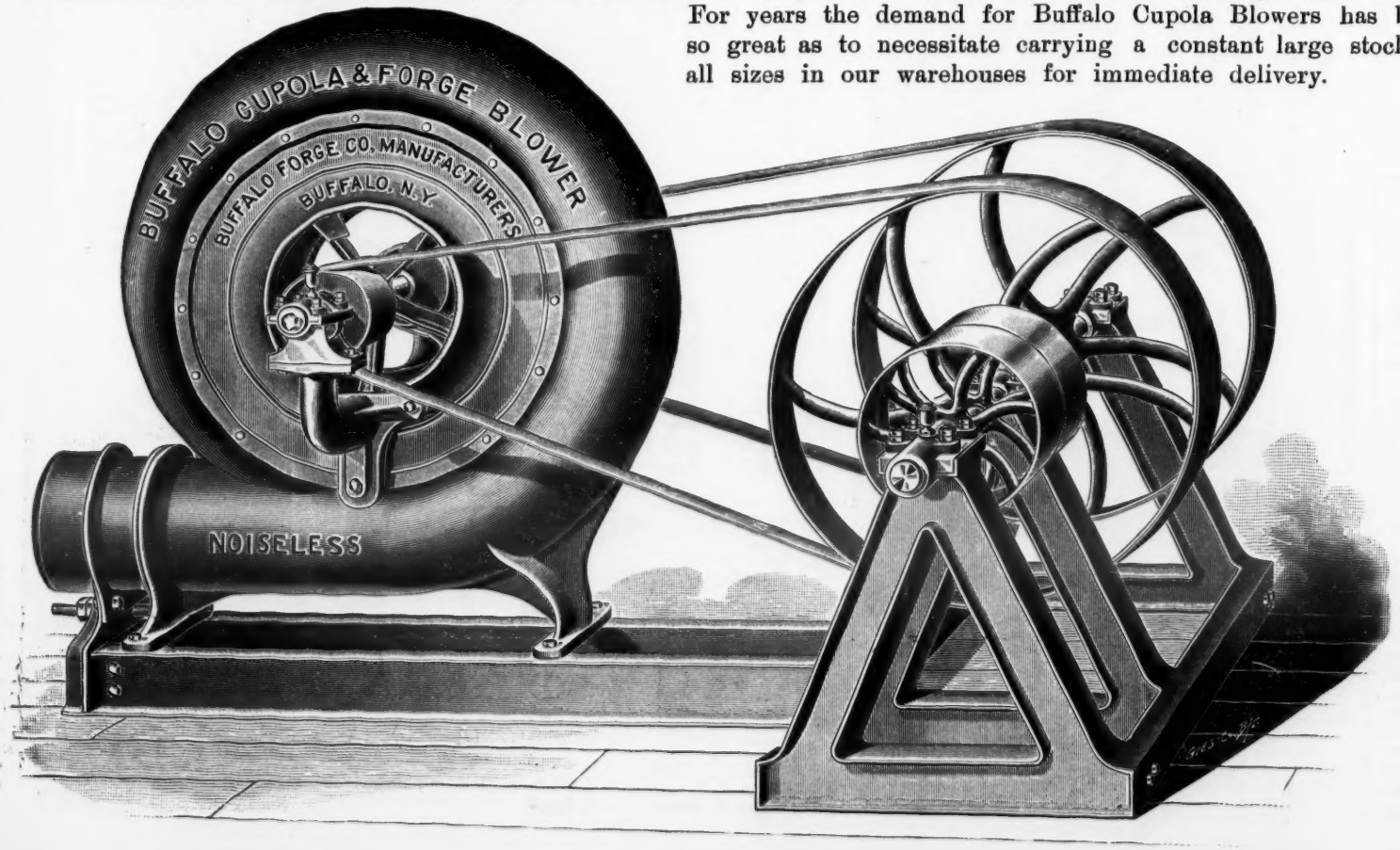
(To be Continued.)

Cross & Weller's Foundry and Richmond Bros Machine Shop, at St. Johns, Mich., have been consolidated under the name of the St. Johns Iron Works.

Montreal has a foundrymen's association. Montreal foundrymen have been for some time watching the good work done by the foundrymen's associations elsewhere and have felt that by a little effort they might accomplish much good for themselves. As a result preliminary meetings have been held at which H. R. Ives has been chairman and Wm. Rodden secretary. A committee, consisting of both of those gentlemen and Messrs. W. Greig, Walter Laurie and Joseph Arreffe were appointed to prepare by-laws.

The Latest Developments in Foundry Blower Construction is fully detailed in the 1896 catalogue of the Buffalo Forge Company, Buffalo, N. Y., U. S. A. You are, perhaps, remodeling or building a new plant. Much data of unusual interest is contained therein. Its value needs no emphasis to those who have reviewed previous issues.

For years the demand for Buffalo Cupola Blowers has been so great as to necessitate carrying a constant large stock of all sizes in our warehouses for immediate delivery.



Improved Sand Blast Apparatus.

MATHEWSON'S PATENT.

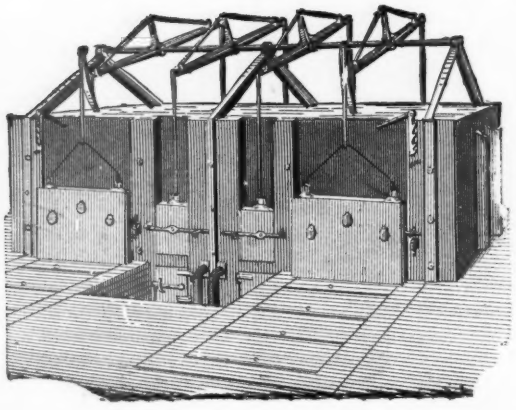
By the use of common, sharp, dry sand, and with compressed air at from 10 to 15 lbs. pressure per square inch to propel the sand this Apparatus will **CLEAN** all forms of castings more thoroughly than is possible by hand, for half the total cost, and in a space of time that cannot be conceived until the machinery has been seen in actual operation.

For small castings a Special Tumbling Barrel is worked in connection with the Sand Blast Apparatus. The Air Compressor and Air Tanks used in connection with this Apparatus are especially designed to supply, most economically and satisfactorily, the requisite amount of free air at the required pressure. For further particulars, apply to

For
Cleaning Castings
Forgings
Sheet Metals, Etc

WARD & NASH, AGENTS, ※ 33 PURCHASE ST., BOSTON
30 S. CANAL ST., CHICAGO

Foundry Rattlers,
Annealing Ovens,
Case-Hardening Furnaces,
Core Ovens.



FINE CASTINGS
OUR SPECIALTY.

Brown & Sharpe Mfg. Co.

PROVIDENCE, R. I.

BUYERS' DIRECTORY.

ALUMINUM.
Cowles Electric Smelting & Aluminum Co., Lockport, N. Y.

AIR HOISTS.
Whiting Foundry Equipment Co., Harvey, Ill.

BARROWS, TRUCKS, ETC.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Lansing Wheelbarrow Co., Lansing, Mich.

BLOWERS.
Buffalo Forge Co., Buffalo, N. Y.
Connersville Blower Co., Connersville, Ind.
Garden City Fan Co. Chicago, Ills.
Root, P. H. & F. M. Company, Connersville, Ind.
Sturtevant Company, The B. F., Boston, Mass
Wilbraham Baker Blower Co., Philadelphia, Pa.

BRONZES.
Cowles Electric Smelting and Aluminum Co., Lockport, N. Y.

CHARCOAL.
Springfield Facing Co., Springfield, Mass.

COKE.
Washington Coal and Coke Co., 7 Wood St., Pittsburg, Pa.

CORE COMPOUNDS.
American Glutrose Works, Philadelphia, Pa.
Stewart, W. H., 182 Front St., New York.

CORE OVENS.
Millett Core Oven Co., Brightwood, Mass.

CORE OVEN CARS.
Lansing Wheelbarrow Co., Lansing, Mich.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Foundry Outfitting Co., Detroit Mich.
Whiting Foundry Equipment Co., Chicago.

CRANES.
Addyston Pipe and Steel Co., Cincinnati, O.
Craig Ridgeway & Sons, Coatesville, Pa.
Harrington, E., Sons & Co., Philadelphia, Pa.
Phœnix Iron Works Co., Cleveland, Ohio.
Shaw Electric Crane Co.
Wm. Sellers Co.
Whiting Foundry Equipment Co., Harvey, Ill.

CRUCIBLES.
Joseph Dixon Crucible Co., Jersey City, N.J.
McCullough-Dalzell Co, Pittsburg, Pa.
Taylor Crucible Co., Robt. J., Philadelphia, Pa.

CUPOLAS.
Foundry Outfitting Co., The, Detroit, Mich.
Springfield Cupola Co., Springfield, O.
Whiting Foundry Equipment Co., Harvey, Ill.

FIRE-BRICK.
Brooklyn Fire Brick Works, Brooklyn, N. Y.
Garden City Sand Co., Chicago, Ill.
Obermayer Company, The S., Cincinnati, Ohio
Ohio Sand and Clay Company, Columbus, Ohio
Paxson, J. W., & Co., Philadelphia, Pa.
Smith Foundry Supply Company, The J. D., Cincinnati, Ohio.

FOUNDRY LADLES.
Foundry Outfitting Co., The, Detroit.
Obermayer Company, The S., Cincinnati, Ohio.
Paxson & Co., J. W., Philadelphia, Pa.
Phœnix Iron Works Co., Cleveland, Ohio.
Smith Foundry Supply Company, The J. D., Cincinnati, Ohio.
White-head Bros. Co New York.
Whiting Foundry Equipment Co., Harvey, Ills

FOUNDRY PLANS.
Foundry Outfitting Co., The, Detroit, Mich.
Whiting Foundry Equipment Co., Harvey, Ills

FOUNDRY SUPPLIES.
Albany Facing Co., Albany, N. Y.
Springfield Facing Co., Springfield, Mass.
Foundry Outfitting Co., The, Detroit, Mich.
Joseph Dixon Crucible Co. Jersey City, N J.
Garden City Sand Co., Chicago, Ill.
Obermayer Company, The S., Cincinnati, Ohio
Paxson & Co., J. W., Philadelphia, Pa.
Smith Foundry Supply Co., Cincinnati, O.
The U. S. Graphite Co., Saginaw, Mich.

IRON BUILDINGS.
Berlin Iron Bridge Company, East Berlin, Conn
Wrought Iron Bridge Company, Canton, Ohio.

IRON PILLER.
D. N Clark & Co, Shelton, Conn.
Vreeland Tompkins, Jersey City, N. J.

MANGANESE AND SILICON.
Cowles Electric Smelting and Aluminum Co., Lock port, N. Y.

MOLDING MACHINES.
Tabor Mfg. Company, 39 Cortlandt st., New York

MOLDING SAND.
Foundry Outfitting Co., The, Detroit.
Garden City Sand Co., Chicago, Ill.
Paxson & Co., J. W., Philadelphia, Pa.

OIL BURNERS.
Thurman Fuel Oil Burner Co., Indianapolis, Indiana,

PATTERN FILLETS.
Canton Fillet Co. Canton, Ohio.

PATTERM LETTERS.
Campbell, Twining, Paterson, N. J.

PATTERN MAKERS.
The Gobeille Pattern Co., Cleveland, Ohio.

PATTERN MAKERS SUPPLIES.
Frank H. Clement Co., Rochester, N. Y.
The J. A. Fay & Egan Co., Cincinnati, Ohio.
Milwaukee Foundry Supply Co., Milwaukee, Wis.

SAND BLAST.
Ward & Nash, Boston and Chicago.

SNAP FLASKS.
C. H. Green & Co., Syracuse, N. Y.

SPRUE CUTTERS.
Gould & Eberhardt, Newark, N. J

TUMBLING BARRELS.
Brown & Sharpe Mfg. Co., Providence, R. I.
Paxson & Co., J. W., Philadelphia, Pa.
Stover Mfg. Co., Freeport, Ills.
Whiting Foundry Equipment Co., Harvey, Ills.

VENTILATOR IRONS.
Delvin, Thos. & Co. Philadelphia, Pa.

PATTERNS FOR CASTINGS.

ANYTHING, from a Toy Pistol to a Steel Plant.
Largest Pattern Works in the World.

The Gobeille Pattern Co., Cleveland, O.

W. H. STEWART'S LIQUID Founders' Core Compound

Used by the Principal Foundries in the U. S.

Prepared ready for use in **LIQUID FORM** to be mixed with the regular core sand. The cores are **DAMP-PROOF** and do not absorb moisture. **SPUTTERING** and **BLOWING** by reason of damp cores are avoided. The cores are **HARDER, FIRMER** and **STRONGER** than can be made by any other process and cost less to make. They can be set at any time and **EASILY CLEANED FROM THE CASTING.** Send for our descriptive pamphlet with prices and directions for use.

W. H. STEWART,
SOLE MANUFACTURER,
182 FRONT ST. NEW YORK.

Cast Steel Cement.

DO not pay high prices for a material for filling blow holes and imperfections in castings.

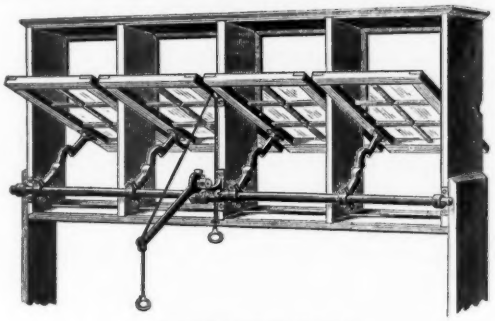
Cast Steel Cement

is lowest in price and does the best work.

D. N. CLARK & CO.

SHELTON, CONN.

THE NATIONAL SELF-LOCKING VENTILATOR IRONS



PATENTED JANUARY 15, 1889.

For Foundries, Annealing Shops, Blacksmith Shops, Dye Houses, Abattoirs, Medical Colleges, Weave Sheds, Green Houses, Rolling Mills, Glass Works and all places where Ventilators are used.

Simple, always in order and always Locked, whether open or closed; no slamming.

—Manufactured and for Sale by—

THOMAS DEVLIN & CO.

Lehigh Ave and 3rd St., **PHILADELPHIA, PA.**

CIRCULAR SENT ON APPLICATION.

Alphabetical Index to Advertisers

	PAGE
Addyston Pipe & Steel Co.	33
American Glutrose Works.	32
Berlin Iron Bridge Co.	7
Boutelle, R. W.	27
Brown & Sharpe Mfg. Co.	22
Brooklyn Fire Brick Works	34
Buffalo Forge Co.	21
Buffalo Wire Brush Works	30
Canton Fillet Co.	29
Campbell, Twining	30
Clark, D. N.	22
Clements, F. H.	35
Cleveland Chaplet Mfg. Co.	27
Clinton Iron & Steel Co.	31
Connersville Blower Co.	Back Cover
Cowles Electric Smelting and Aluminum Co.	Inside Cover
Craig Ridgway & Sons	15
Diamond Machine Co.	35
Devlin, Thos. & Co.	24
Dixon Crucible Co., Jos	37
Fay Egan Co, The J.	36
Foundry Outfitting Co.	19
Garden City Fan Co.	31
Garden City Sand Co.	38
Gobeille Pattern Co., The	24
Gould & Eberhardt	27
Green, C. H. & Co.	36
Kilbourne & Jacobs Mfg. Co.	26
Keep, W. J.	28
Kelly & Co., T. P.	3
Lansing Wheelbarrow Co	28
Millett Core Oven Co.	34
Milwaukee Foundry Supply Co.	27
McCullough-Dalzell Co	4
Obermayer Co., The S.	1
Paxson & Co., J. W.	2
Phœnix Iron Works Co.	16
Roots Company, P. H. & F. M.	Colored Insert
Sellers, Wm. & Co.	18
Shaw Crane Co.	17
Smith Foundry Supply Co., The J. D.	Cover
Springfield Facing Co	9
Stewart, W. H.	24
Stover Mfg. Co.	26
Sturtevant & Co. B. F.	10
Stow Flexible Shaft Co	14
Tabor Mfg. Co.	9
Taylor, Robt. J.	6
Thurman Fuel Oil Burner Co.	32
Tompkins, Vreeland	33
U. S. Graphite Co.	37
Washington Coal and Coke Co.	5
Whiting Foundry Equipment Co.	20
Wrought Iron Bridge Co.	8
Wilbraham Baker Blower Co.	11

THE FOUNDRY

The only foundry paper published in the world, and an authority on all matters pertaining to the foundry business.

RATES OF SUBSCRIPTION.

Single subscription to all parts of the United States and Canada, $1 per annum.
" " Universal Postal Union, 1.75 "
Eight or more subscriptions at one time, 75 cents each.

ADVERTISING RATES.

One page	per month,	$20.00
Half page	"	12.00
Quarter page	"	7.00

When space is specified an extra charge of five per cent. on the above figures will be made. All pages between front cover and reading matter reserved for whole page advertisements.

Advertisers in THE FOUNDRY have the privilege of discontinuing their advertisements at any time after they have had three insertions, and will only be charged pro rata for the number of insertions printed. They also have the privilege of changing advertisements as often as desired.

The publishers of THE FOUNDRY appreciate the fact that it is customary for publications, especially the class known as Trade Journals, to quote a rate for advertising from which greater or less discounts are given, according to the persistency of the advertiser. This system is manifestly unfair as tending to show partiality. We have deducted the usual discount before quoting rates thus giving it to all alike, and no reduction of any sort on the abov rates can be made.

Copy for advertisements should be in by the 25th of the month preceding publication.

"Columbus" Steel Tubular Wheelbarrow.

Made throughout of the best quality of high grade steel. Tray stamped without joint, seam or rivet, with edge bound over steel rod. Handles, Legs and Wheels the strongest put upon Tubular Barrows.

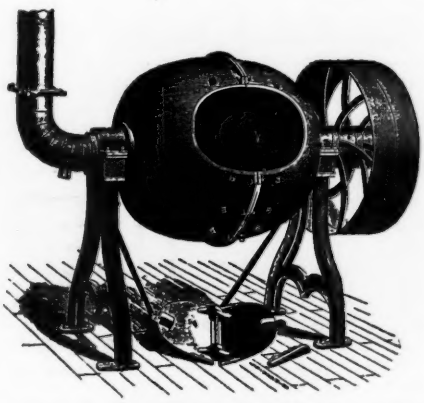
Made in nine different sizes. Largest manufacturers in the United States of TUBULAR BARROWS, STEEL CHARGING BARROWS and WOODEN BARROWS of every variety. Write for catalogue to

The Kilbourne & Jacobs Manufacturing Co.

LINCOLN STREET, COLUMBUS, OHIO.

STOVER'S IMPROVED

EXHAUST TUMBLING BARREL



The Stover Egg Shaped Barrel does double the work of any other with less noise and power. It gives the contents a double motion or action—from ends to center and from side to center—causing a thorough mixing and rubbing together of all the parts contained therein, cleaning and polishing the contents better and quicker than any other form of barrel.

Sent on 30 days approval to any responsible manufacturer of light castings, malleable iron wire nails, or any other small articles that require cleaning and polishing.

For full particulars, address,

Stover Manufacturing Co.

205 RIVER STREET,

FREEPORT, ILL

DO YOU MAKE YOURS?

? ? ? ? ? ?

HENRY HANSEN

In his paper read before the September meeting of the Western Foundrymen's Association said: "The ordinary chaplets for which almost every foundry used to rely on the blacksmith nearest at hand, which has probably been the cause of more castings being discarded and patched up than any other thing of their size are now being made by special methods and presented in a far superior condition, besides being placed on the market at a price that would not keep a blacksmith in tobacco, at the same time there are many foundries that still insist on making their own inferior Chaplets."

JOHN PETTIGREW

Superintendent of the Illinois Steel Company's foundry, at Joliet, Ills. said at the same meeting on this subject: "It is only about six months ago that I first bought factory made chaplets. We were making our own chaplets and lost a great many castings from their not being properly made. After we had bought the first lot for, I think, 60 cents a hundred, I commenced to figure up the list of those we had made and found it had been at least $2.50 and besides were not as good an article."

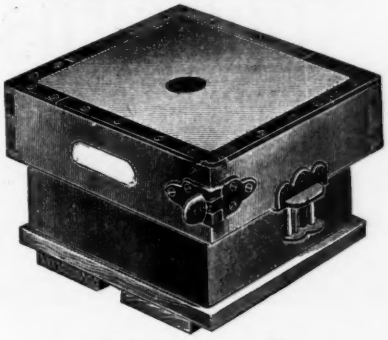
WE KEEP ALL KINDS IN STOCK.

Cleveland Chaplet & Mfg. Co.

CLEVELAND, OHIO.

Boutelle's Improved Snap Flask

FOR HEAVY WORK.



PATENTED JULY 17, 1894.

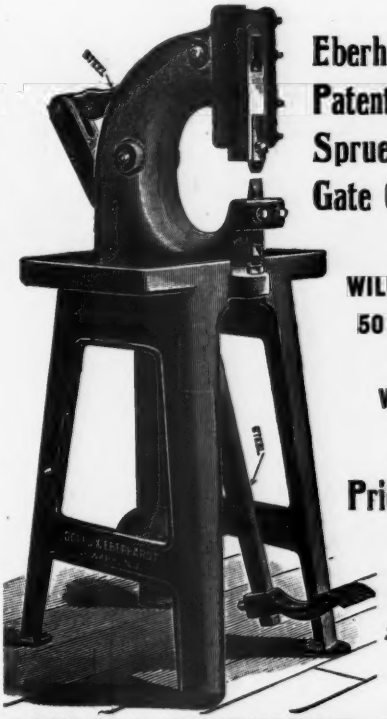
NO STRAINING OF WORK.

SAVES Floor Space SAND TIME MONEY

Send for Circulars and Price List,

L. W. BOUTELLE,

ORANGE, MASS.



Eberhardt's Patented Sprue or Gate Cutter

WILL STAND 50 YEARS OF WORK

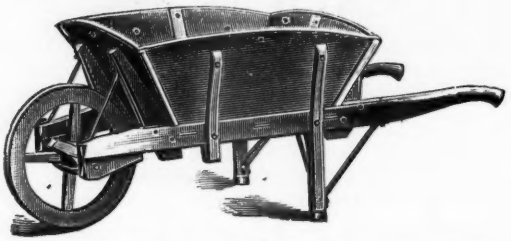
Price Low

Send to

GOULD & EBERHARDT, NEWARK, N. J.

Lansing Hand-Made Scrap Iron Barrow

Figure 238.



This barrow is made for heavy work in and about foundries, rolling mills, machine shops, etc., and is made of the very best seasoned timber: Handles are made of 2 x 3 in. white oak; box is made of 1¼ in. maple. Size of box at top, 26 in. wide at wheel end, 30 in. wide at handle end, 43 in. long. Has a heavy wheel 19 in. in diameter, 1¾ in. tread, and has ¼ in. tire; we put heavy iron bands on the ends of the hub. Weight of barrow is 125 lbs. Has iron bands on ends of legs and all iron braces are of ⅝ in. round iron. All irons are bolted.

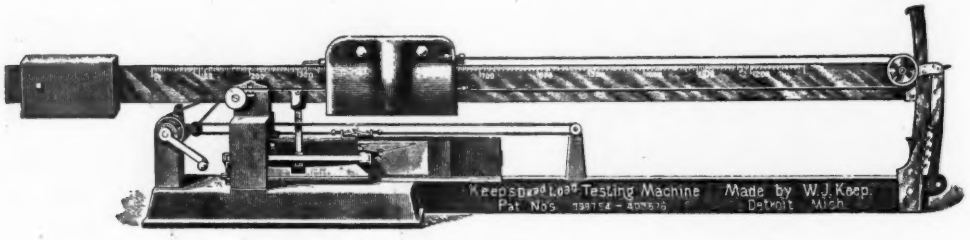
Telegraph name, Seacoast.

WRITE FOR PRICES.

We make a Specialty of Steel and Wood Barrows for Foundries.

LANSING WHEELBARROW CO., LANSING, MICH.

"Keep's Test" Apparatus.



By its Use
You can Produce
The Best Quality
Of Cast Iron from
The Cheapest Pig Iron.

Keep's Testing Machine.

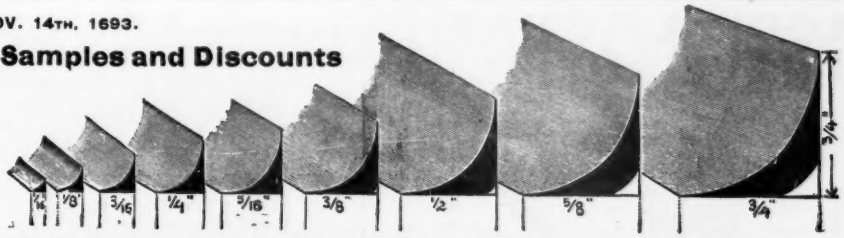
2 Sets Bronze Patterns with Followboard.
1 Pair Yokes for Shrinkage and Chill.
4 Iron Flasks.
1 Taper Steel Scale $\frac{50}{1000}$ to $\frac{250}{1000}$
1 Table for Measuring Shrinkage.

For Circulars and Price List, Address

W. J. KEEP, Detroit, Mich

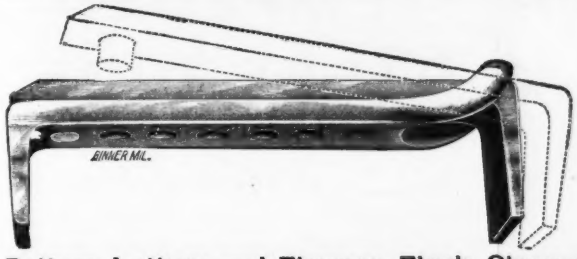
PATENTED NOV. 14TH, 1693.

Write for Samples and Discounts



Pattern Makers and Founders Should use none but the **BELDING PATENT LEATHER FILLET**, the only one made scientifically correct. Quickly applied to any corner, straight surface, single or compound curves, wood or iron, without nails or clamps. Once used, always used. Send sample order. **Proper Discounts will be Allowed You.**

THE CANTON FILLET CO. **Canton, Ohio.**



THIS is our **ADJUSTABLE CLAMP.** The Most Convenient thing possible in any foundry. We also manufacture a large line of Rapping Plates, Lifting Screws, Etc.

Pattern Letters and Figures, Flask Clamps and Fittings, Leather Fillet Cutters, Universal Trimmers, Dowel Pins, Etc.

Milwaukee Foundry Supply Company, **MILWAUKEE, WIS.**

"THE IRON FOUNDER" SUPPLEMENT

A COMPLETE ILLUSTRATED EXPOSITION OF

The Art of Casting in Iron.

COMPRISING THE

ERECTION AND MANAGEMENT OF CUPOLAS, REVERBERATORY FURNACES, BLOWERS, DAMS, LADLES, ETC.; MIXING CAST IRON; FOUNDING OF CHILLED CAR-WHEELS; MALLEABLE IRON CASTINGS; FOUNDRY EQUIPMENTS AND APPLIANCES; GEAR MOLDING MACHINES; MOLDING MACHINES; BURNING; CHILLING; SOFTENING; ANNEALING; POURING AND FEEDING; FOUNDRY MATERIALS; ADVANCED MOLDING; MEASUREMENT OF CASTINGS; WROUGHT IRON STEEL, ETC.

ALSO

THE FOUNDING OF STATUES; THE ART OF TAKING CASTS; PATTERN MODELLING; USEFUL FOMULAS AND TABLES.

BY SIMPSON BOLLAND,

Practical Molder and Manager of Foundries; Author of "The Iron Founder," etc.

400 Pages. Fully Illustrated.

Price $2.50, Post-Paid; with THE FOUNDRY, one year $3.00.

WE BURN HARDWOOD

CHARCOAL

FOR FIRES.

CAR LOTS DELIVERED TO ALL PARTS OF THE U.S.

OUR CHARCOAL FACING FOR

BRASS FOUNDRIES

IS UNLIKE ANY OTHER.

IT WILL PAY YOU TO KNOW ABOUT IT.

SPRINGFIELD FACING CO.

SPRINGFIELD, MASS.

LOOK AT WHAT I HAVE GOT

W 2

Brass Pattern Letters and Figures

With Spurs on the Back to hold them on.
They Never Drop off.

MADE IN 3 SIZES—½ in., ⅝ in., ¾ in.

Sent by mail on receipt of

2 1-2c PER LETTER

For small orders, and same discounts as Lead Letters in Quantities.

TWINING CAMPBELL,
ALUMINUM and BRASS FOUNDER,
PATERSON, N. J.

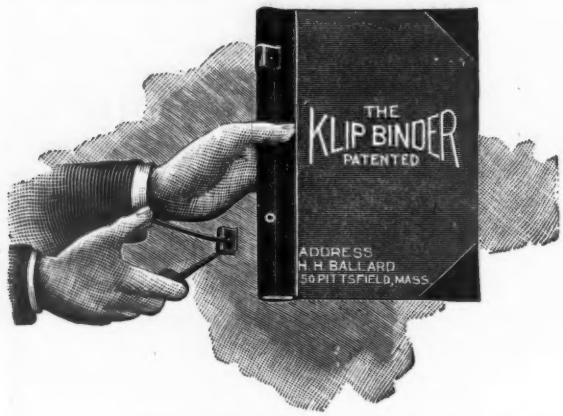
C. D. ZIMMERMAN, PROP.

TEMPERED STEEL WIRE BRUSHES

OF EVERY DESCRIPTION

123-131 NORWOOD AVE.

BUFFALO, N. Y.



Binders FOR THE Foundry.

Every Subscriber should have a

BINDER AND PRESERVE EVERY COPY OF HIS PAPER. . . .

After looking the field carefully over, we have at last selected a Binder that will give, we think, perfect satisfaction, and which we can cordially recommend. Will hold 12 copies.

SENT POSTPAID ON RECEIPT OF $1.00.

The Foundry Publishing Co., DETROIT, . . MICH.

TOMPKINS' "SMOOTH-ON CASTINGS"

IRON COMPOUND

Will stop a hole steam tight or Repair a defect in Castings and often save 100 times its cost in time and money in repairing defects in Cast Iron Patterns or other Castings . . . . . .

VREELAND TOMPKINS, Manufacturing Chemist, 533 COMMUNIPAW AVE., JERSEY CITY, N. J.

Don't be FOOLED and think High Silicon Irons are a "cure all." Remember a "silk purse is not made out of a sow's ear."

The Best Material Only,
Complete Analysis and
Careful Testing . . .

In the Largest Chemical and Physical Laboratory devoted to Foundry Iron in the United . . States is what makes . .

CLINTON INSPECTED FOUNDRY IRON

THE IRON IT IS

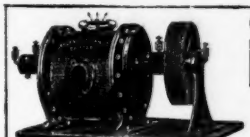
Clinton Iron & Steel Co.
PITTSBURG, PA., U S. A.
15 Cortlandt St. - - NEW YORK.

MECHANICAL DRAWING

Steam Engineering (Stationary, Marine, Locomotive), Electricity, Plumbing, Architecture, Architectural Drawing, Mining, Railroad and Bridge Engineering,

TAUGHT BY MAIL.

Students make rapid progress in learning to draw. Circular free. State subject you wish to study. **The International Correspondence Schools, Scranton, Pa.**



WRITE FOR CATALOGUE.

GARDEN CITY POSITIVE PRESSURE BLOWER
NO GEARS
SAVES 10 TO 15% IN POWER
SIMPLE — POSITIVE — EFFICIENT

GARDEN CITY FAN CO. CHICAGO, ILL. U.S.A.

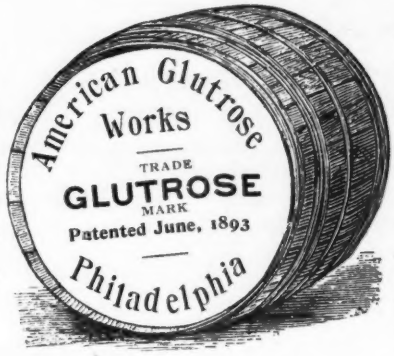
GLUTROSE

(TRADE-MARK)

THE UNIVERSAL LIQUID CORE COMPOUND. PATENTED IN THE UNITED STATES, ENGLAND, FRANCE AND BELGIUM.

Glutrose was invented and is manufactured by a practical foundryman of many years' experience. It has been used in the Pennsylvania Railroad shops at Altoona, and other large foundries for the past three years with most satisfactory results.

Glutrose is cheaper than any other core compound used, will keep any length of time and never varies in quality. It enables foundries to use their sand over and over, thereby effecting a great saving.



Makes the most difficult cores for iron or brass castings. Drys open and porous on the inside and hard on the outside.

Will never blow the castings, will let the air and gases off from a core which is difficult to **vent,** better than any other material in use.

MANUFACTURED BY THE

AMERICAN GLUTROSE WORKS,

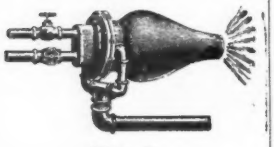
Offices, Penn Mutual Building,

. . . Factories . . .

Camden, N. J. Merchantville, N. J.

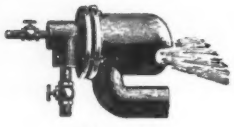
925 Chestnut St., Philadelphia.

Patented.



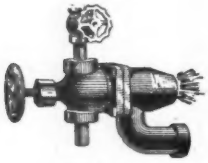
No. 6.

Patented.



No. 4.

Patented.



No. 8.

The Thurman Fuel Oil Burner Co.

DESIGNERS, CONTRACTORS AND ENGINEERS for COMPLETE FUEL OIL EQUIPMENT.

Plans, Specifications and Machinery for Complete Power Plants and Machinery Specialties. The only Perfect Crude Oil Burners on the market. Acknowledged the best.

It is economical, reliable, requires no expert to manage, cheaper than coal. For boilers, furnaces, forges, ovens, dryers, brick kilns, potteries, etc. No soot, no sparks, no smoke.

SPECIALTY FUEL ECONOMY.

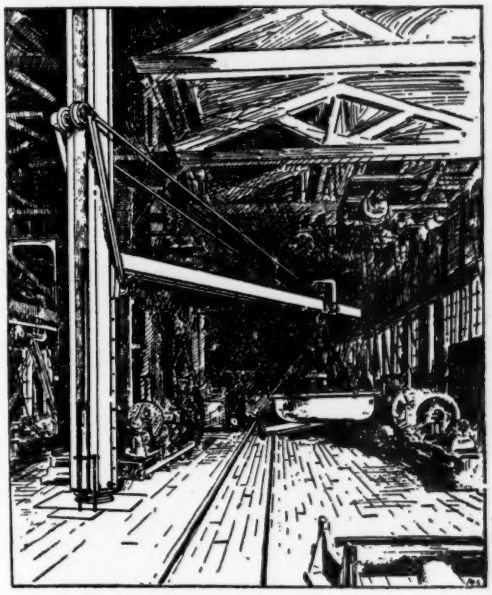
We make a specialty of Fitting Foundries Complete with Fuel Oil Equipment for Crucibles and Core Ovens.

We can bake your cores quicker and cheaper with our system than with coal. Write us.

General Offices, 77 and 78 When Bld.

INDIANAPOLIS, - - INDIANA.

The Addyston Pipe and Steel Co.



DO YOU NEED CRANES? WE MAKE CRANES.

Ask for our Prices on Cranes.

With our special tools we make FLANGE PIPE at low cost. Let us name you prices when you require

Cast Iron, Flange or Hub Pipe or Fittings.

We may be able to supply them to you at less than your cost.

The Addyston Pipe and Steel Co. CINCINNATI, OHIO.

$5.00

DOES ANYTHING PHOTOGRAPHIC—

The Pocket Kodak.

Pocket Kodak, loaded for 12 pictures, 1½ x 2, - $5.00
Developing and Printing Outfit, - - - 1.50

EASTMAN KODAK CO.

Sample photo and booklet for two 2-cent stamps. ROCHESTER, N. Y.

WEST'S

Molder's Text-Book,

BEING PART II, OF

AMERICAN FOUNDRY PRACTICE,

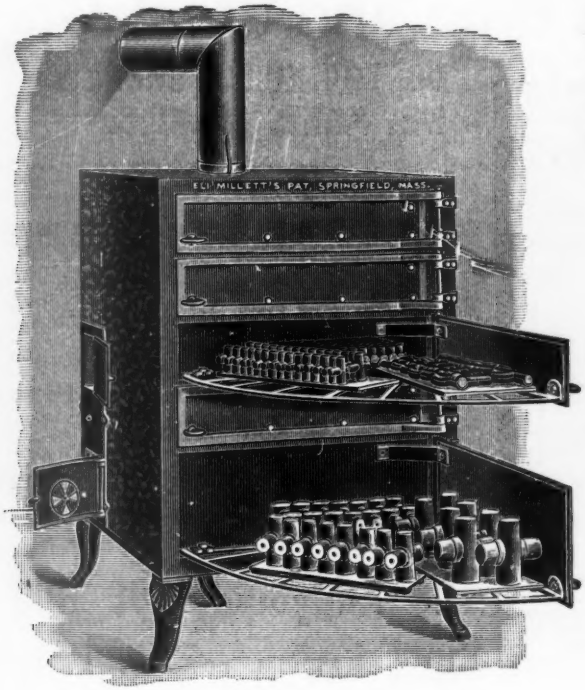
Presenting the Best Methods and Original Rules for obtaining Good, Sound, Clean Castings, and giving Detailed Description for Making Molds Requiring Skill and Experience; also containing a Practical Treatise upon the Construction of Cranes and Cupolas, and the Melting of Iron and Scrap Steel in Iron Foundries.

By THOMAS D. WEST,

Practical Iron Molder and Foundry Foreman, Member of the American Society of Mechanical Engineers, and of the Civil Engineers' Club of Cleveland, O.

461 PAGES. FULLY ILLUSTRATED.

Price, $2.50, Post Paid; With THE FOUNDRY. One Year, $3.00.



Millett's Patent Core Oven

THE BEST IN THE WORLD.

No Foundry using small Cores can afford to be without it.

Over one hundred and fifty in use.

SEND FOR OUR NEW CATALOGUE GIVING NAMES OF THOSE USING THEM.

Millett Core Oven Co.

BRIGHTWOOD, MASS.

ESTABLISHED 1854.

Brooklyn Fire Brick Works

CUPOLA BLOCKS, FIRE SAND, FIRE CLAY, FIRE MORTAR, KAOLIN

AND ALL FIRE MATERIAL REQUIRED FOR FOUNDRY PURPOSES.

Send for Illustrated Catalogue and Prices.

88 Van Dyke Street, BROOKLYN, N. Y.

The A B C of Iron.

The best book for foundrymen published. It is issued in handsome cloth binding, and gives much valuable matter on how to reduce cost of mixtures, and on grading and numbering of pig-iron.

FORMER PRICE $2.00

NOW $1.00.

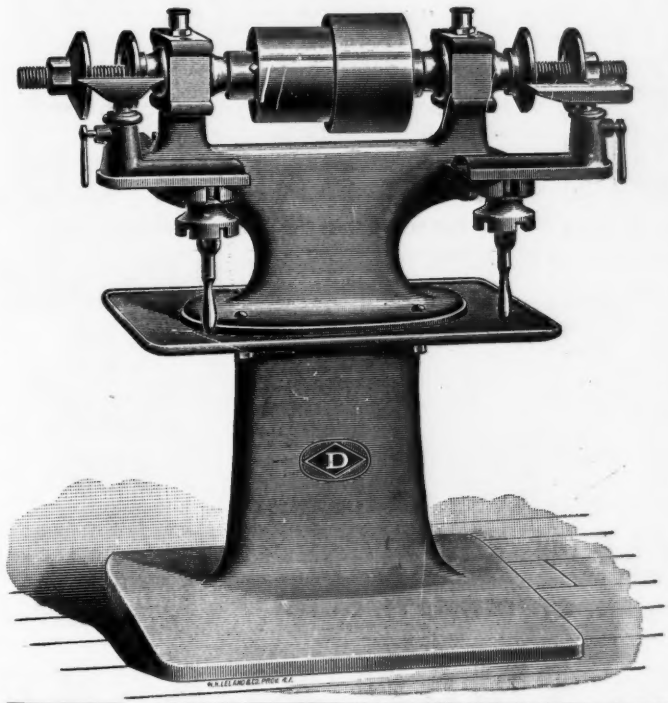
Order Now of

Foundry Publishing Co.

Griswold Street,

DETROIT, - - MICH.

DIAMOND GRINDER, No. 7



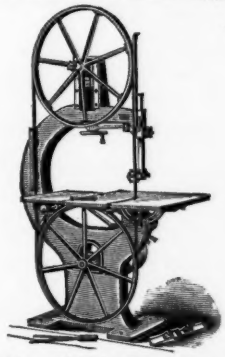
This machine carries two wheels up to 20 inches in diameter. It stands 34 inches from floor to center of spindle. Distance between wheels, 26 inches; length of bearings, 6 inches; diameter of spindle between flanges, 1⅛ inches. The weight of machine as shown, 750 lbs.

For foundrymen, plow manufacturers, stove makers and all others who need heavy, substantial grinders, this machine cannot be too highly commended. Realizing that one style of machinery does not suit the ideas of everybody, we have constructed a large line of grinders for all purposes, including many special devices, and we will cheerfully mail our catalogue to anyone inquiring in good faith. All of our goods are guaranteed and we invite correspondence and solicit your trade.

DIAMOND MACHINE CO.

PROVIDENCE, R. I.
and CHICAGO, ILLS.

LONDON AGENTS,
Chas. Churchill & Co., Limited.



34 in. and 36 in. Band Saw Machine.

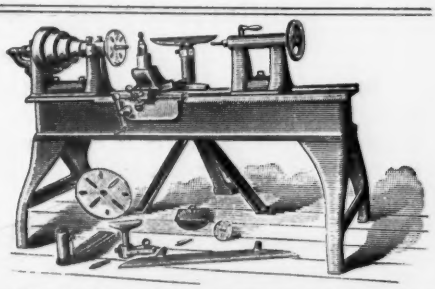
Complete Outfits

FOR

PATTERN SHOPS

Strictly first-class Tools

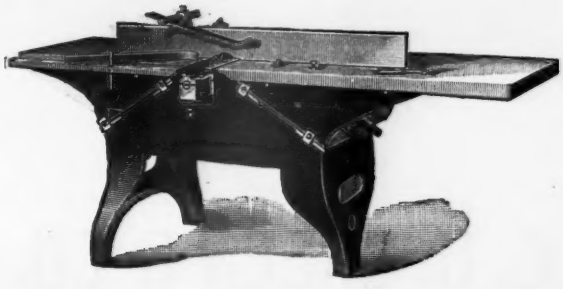
MANUFACTURED BY

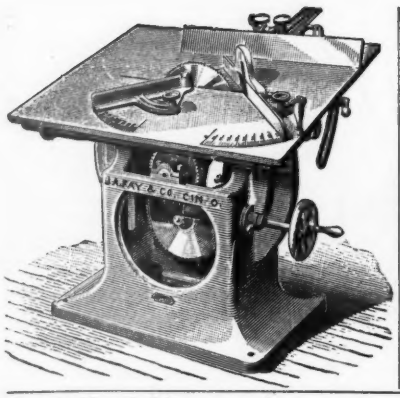


Pattern Maker's Lathes. Iron Bed with or without Carriage.

THE FRANK H. CLEMENT CO. 336 Lyell Avenue, ROCHESTER, N. Y.

No. 1 Variety Saw Bench. All Iron and Steel.





Pattern Makers

Your attention is called to our

.....Double Revolving Circular Saw

With combined Ripping, Cross-Cutting and Beveling Table, cut of which appears herewith. When in need of machinery we trust you will permit us to hear from you.

J. A. FAY & CO.,

526 to 546 West Front Street, CINCINNATI, OHIO.

No. 1 Hand Planer and Jointer

8, 12, 16, 20, 24 or 30 in. wide, with extra long table and patent adjustable beveled fence. We have a complete line of machinery for working wood and will be pleased to submit estimates to those desiring them.

THE EGAN CO.,

417 to 437 West Front St., CINCINNATI, OHIO

MACHINERY FOR FLASK AND PATTERN MAKERS

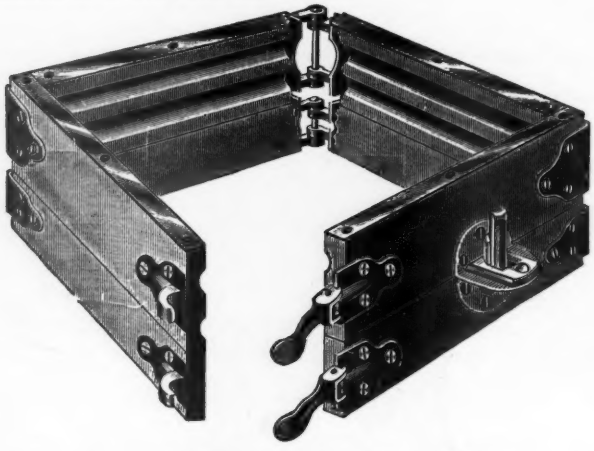
We are the Largest Manufacturers of

SNAP FLASKS

IN THIS COUNTRY, FOR TWO REASONS.

First—Our Flask has been found to be the best in the market and foundrymen insist upon having them, no matter who they buy of.

Second—Making them in such large quantites and using the most improved machinery enables us to sell them cheap.



That is all there is to it—

QUALITY and PRICE.

Made by skilled mechanics out of the best kiln-dried lumber and with all malleable iron fittings.

If you desire discounts, write us and mention *The Foundry*.

C. H. GREEN & CO. 1400 GRAPE STREET. Syracuse, N. Y.

DIXON'S No 2441

GRAPHITE FACING

Made of Ticonderoga Graphite; Better than Ceylon Lead; Better than Silver Lead; Behaves well under the Slicker; Will not wash before the metal; Adheres well to the Sand; Burns slowly so the Gases are nicely relieved.

No. 2441 MEANS PROGRESS IN FACINGS.

SEND FOR AN ENVELOPE SAMPLE.

Jos. Dixon Crucible Co., JERSEY CITY, New Jersey.

MEXICAN GRAPHITE FOUNDERS' WASH

The guaranteed equal of any Silver Lead Facing. Applied with hand, shake-bag, or brush. Mixed in water, it makes **A Perfect Wash** for cores and dry sand work. Made from the pure product of our Graphite mine in Mexico, owned and operated by ourselves. This Facing is our specialty and is in use in over 900 foundries in the United States and Canada. **It will save you over $5.00** per barrel in first cost alone, and is submitted subject to your entire approval.

THE UNITED STATES GRAPHITE CO.

Graphite Mines—
TORRES, SONORA, MEXICO.

Office and Factory—
SAGINAW, MICH, U. S. A.

NOTE—Don't fail to ask us for some pencils. They are the finest in the world, and we keep them for gratuitious distribution, and esteem it a pleasure to supply them on request.

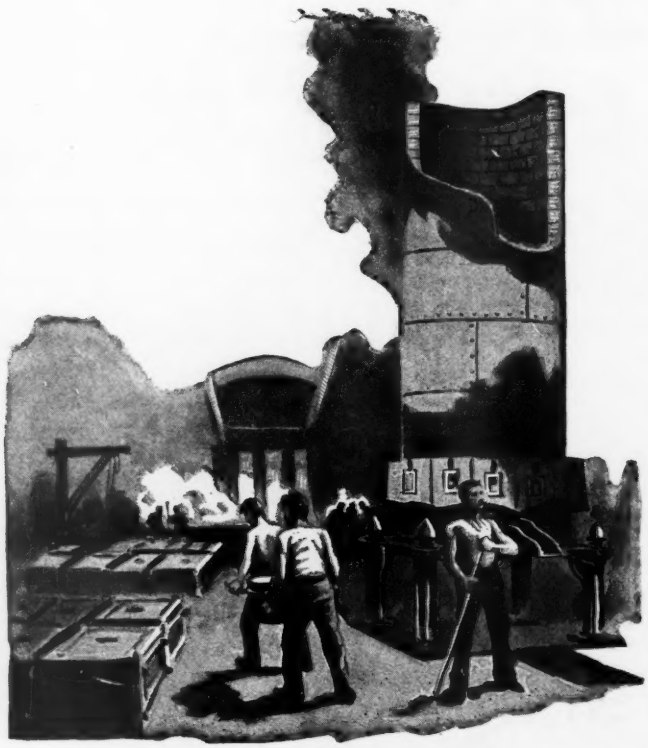
At a low estimate the world's production is 700,000,000 pencils annually. Nearly every high grade pencil, and over half of all the pencils made (over 350,000,000 per year) are made from our Mexican Graphite.

Why Not Make a New Start

And commence the New Year by ordering **"Wigton Steel," "Franklin Crown," "Sligo"** or **"Standard"** Fire Brick for your . . . . . .

Cupolas

and while you are making this change, why not try our "WANATAH," "MCHENRY," "CENTERTON," "NEWPORT," or ALBANY Moulding Sand. **REMBMBER, We guarantee Every Article we Sell.** All we ask is a trial. When ordering do not forget that we sell **Bellows, Riddles,** Facings and all kinds of Supplies for the Foundry



Write us and mention The Foundry.

GARDEN CITY SAND CO.

TELEPHONE 5102 MAIN.

1010 SECURITY BUILDING. CHICAGO.